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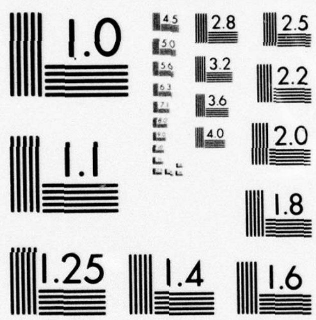
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LORAN-C, OMEGA, AND DIFFERENTIAL OMEGA APPLIED TO THE CIVIL AIR NAVIGATION REQUIREMENT OF CONUS, ALASKA, AND OFFSHORE.

VOLUME III. SUPPORTING APPENDICES.

AD No.
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F. G. Karkalik
E. D. McConkey

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16. Abstract

The objectives of this study were basically twofold. The first was to validate the civil air navigation requirements for CONUS, CONUS Offshore, Alaska, and Alaska Offshore. A requirements matrix was developed to provide a common basis for defining the requirements across all the geographic areas considered. The second basic objective was to assess the capabilities of Loran-C, Omega, Differential Omega, and VLF communications toward meeting the requirements.

Loran-C offers total all-altitude coverage for all geographic regions given existing and proposed chains. The primary drawback is the large area and, hence, number of aircraft affected by single station outage. With suitable redundancy, Loran-C could meet the civil air navigation requirements as a primary or supplementary navigation system in all geographic regions.

Omega lacks adequate coverage over CONUS. Therefore, Omega and Differential Omega are candidates only in Alaska, Alaska Offshore and most of CONUS Offshore. Omega, however, does not meet the accuracy requirements for nonprecision approaches or in high density terminal areas, whereas, Differential Omega is expected to.

The VLF communications system is not dedicated to navigation, hence, reliability becomes an issue. With suitable redundancy the scheduled and unscheduled down

17. Key Words Loran-C, Omega, Differential Omega, Navigation Systems, Navigation Requirements, Civil Aviation, Nonprecision Approach	18. Distribution Statement Document is available to the U.S. public through the National Technical Information Service, Springfield, Virginia 22161.

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16. Abstract (Continued)

times for maintenance becomes less of a problem. Used in conjunction with Omega signals, the VLF communications signals will provide adequate redundancy and usable geometry.

A potentially significant benefit offered by the candidate systems considered is the support of non-precision approach (NPA) requirements. A separate element of the study, which analyzed all systems considered, was devoted to this topic. Loran-C was found to exceed the NPA requirements in all regions and Differential Omega exceeded them in Alaska, Alaska Offshore and most of CONUS Offshore. The other systems did not meet the NPA requirements including Differential Omega over CONUS.

The report is presented in three separate volumes. Volume I presents the executive summary and Volume II presents the detailed technical analysis supporting this summary. Further supportive material is presented in the appendices which make up Volume III.

METRIC CONVERSION FACTORS

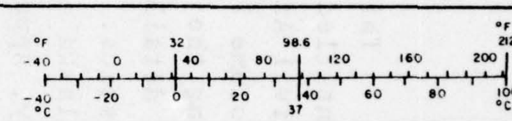
Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in ≡ 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



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INTRODUCTION

This document represents Volume III of a three volume report entitled, "Loran-C, Omega, and Differential Omega Applied to the Civil Air Navigation Requirements of CONUS, Alaska and Offshore." Volume III presents the background Appendices A, B and C supporting the evaluation presentation of Volume II. Appendix A presents a detailed discussion of Loran-C accuracy and coverage characteristics. The results of the Omega accuracy analysis in the CONUS, Alaska and offshore regions are presented in Appendix B. Finally, Appendix C presents the trade-off analysis for the Differential Omega configuration presented in Section VI of Volume II.

VOLUME III: SUPPORTING APPENDICES

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APPENDIX A

LORAN-C ACCURACY AND COVERAGE

A.1 INTRODUCTION

The purpose of this appendix is to present a more detailed discussion of Loran-C accuracy and coverage characteristics. The material presented serves as a backup to that presented in the main text. The organization of this appendix is as follows. Section A.4 presents some of the basic considerations in the determination of Loran-C coverage. An example of the determination of the coverage range for a LF transmitter is presented in Section A.5. To complete the discussion of coverage, the location of each of the Loran-C chains is presented in A.5.

A.2 LORAN-C GRID ACCURACY

This section presents the results of some theoretical analyses of grid bias and data from actual field measurements of grid warp in the eastern U.S. The grid bias analysis assumes the presence of an additional secondary factor that is not corrected in the Loran-C receiver/processor. The grid warp effects are presumed to have been caused by coastline effects or mountain/terrain effects upon the Loran-C signal.

This first accuracy consideration discussed in this section shows the results of the theoretical analysis of the grid bias error caused by the additional secondary factor in the Revised East Coast chain. The navigation receiver was assumed to have been programmed with the seawater phase correction term from Figure A.1 ($\sigma = 5$ mho/meter) while the actual propagation conditions were assumed to be represented by a phase retardation corresponding to the $\sigma = .005$ mho/meter curve. The results of the analysis are presented in Figures A.2 through A.5 for various station combinations.

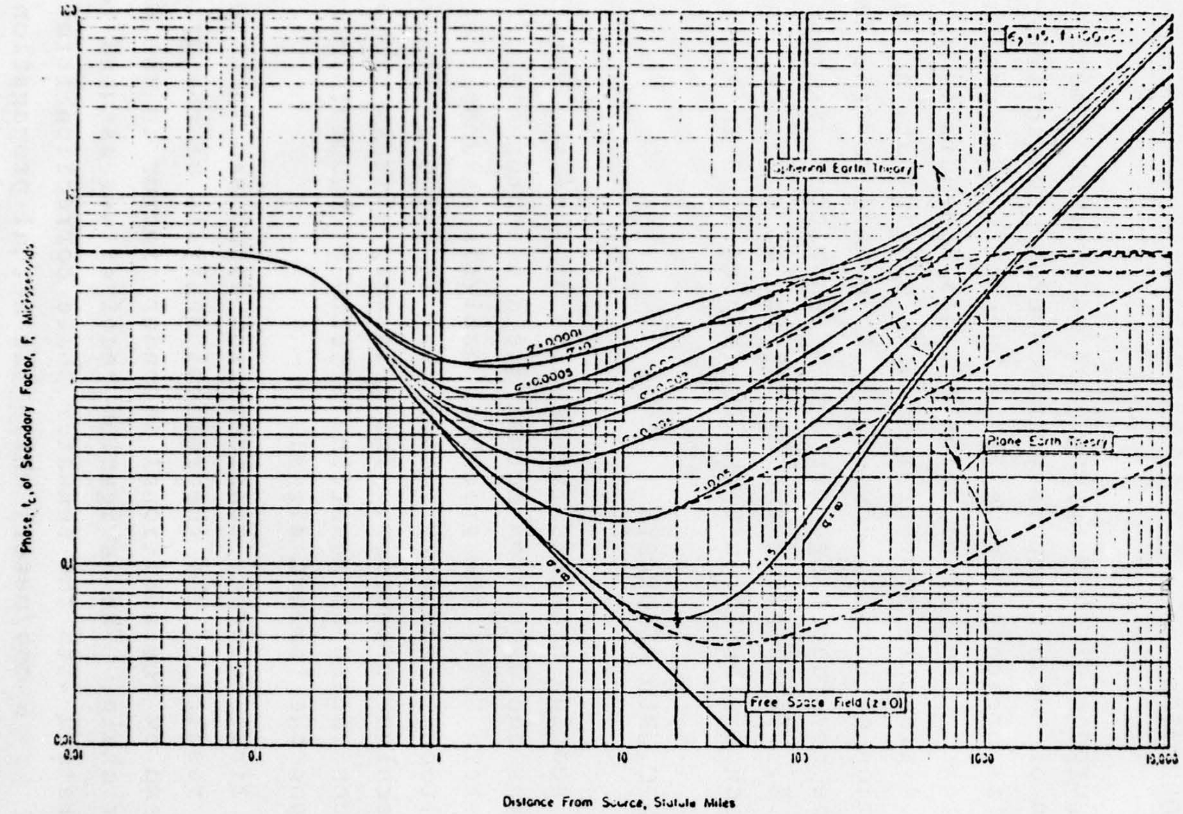


Figure A.1 Phase of Secondary Factor with Distance from Source for Various Conductivities

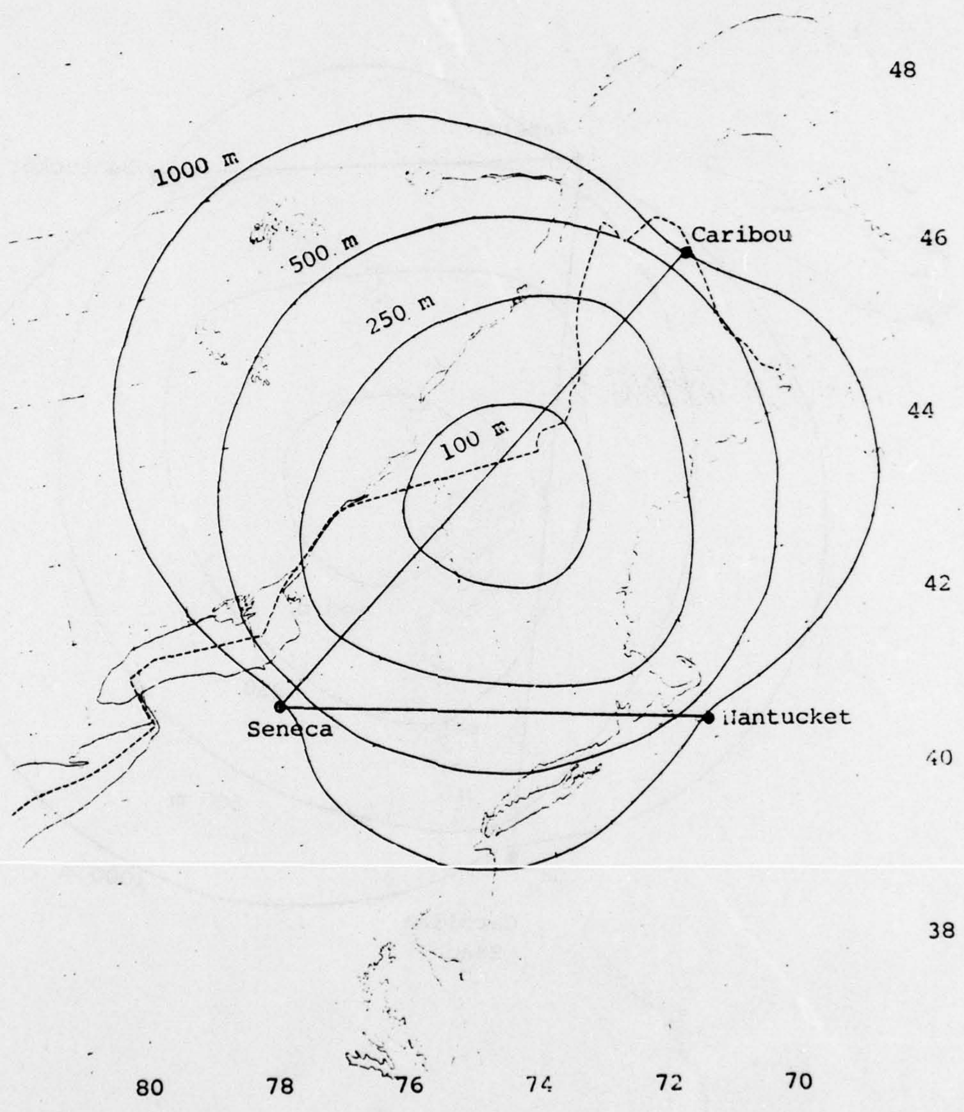


Figure A.2 Theoretical Grid Bias Error for Seneca, Caribou and Nantucket

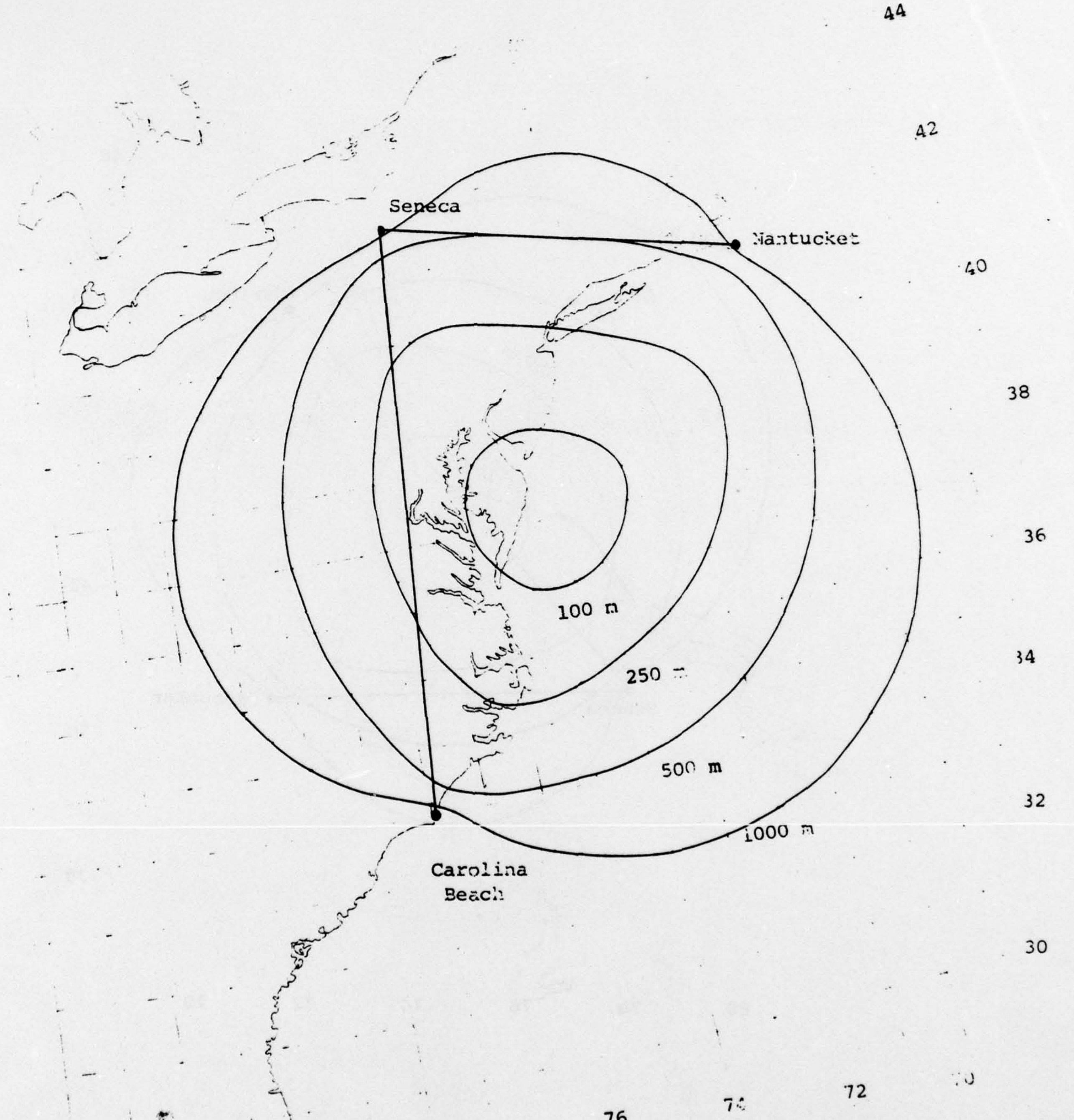


Figure A.3 Theoretical Grid Bias Error for Seneca, Nantucket and Carolina Beach

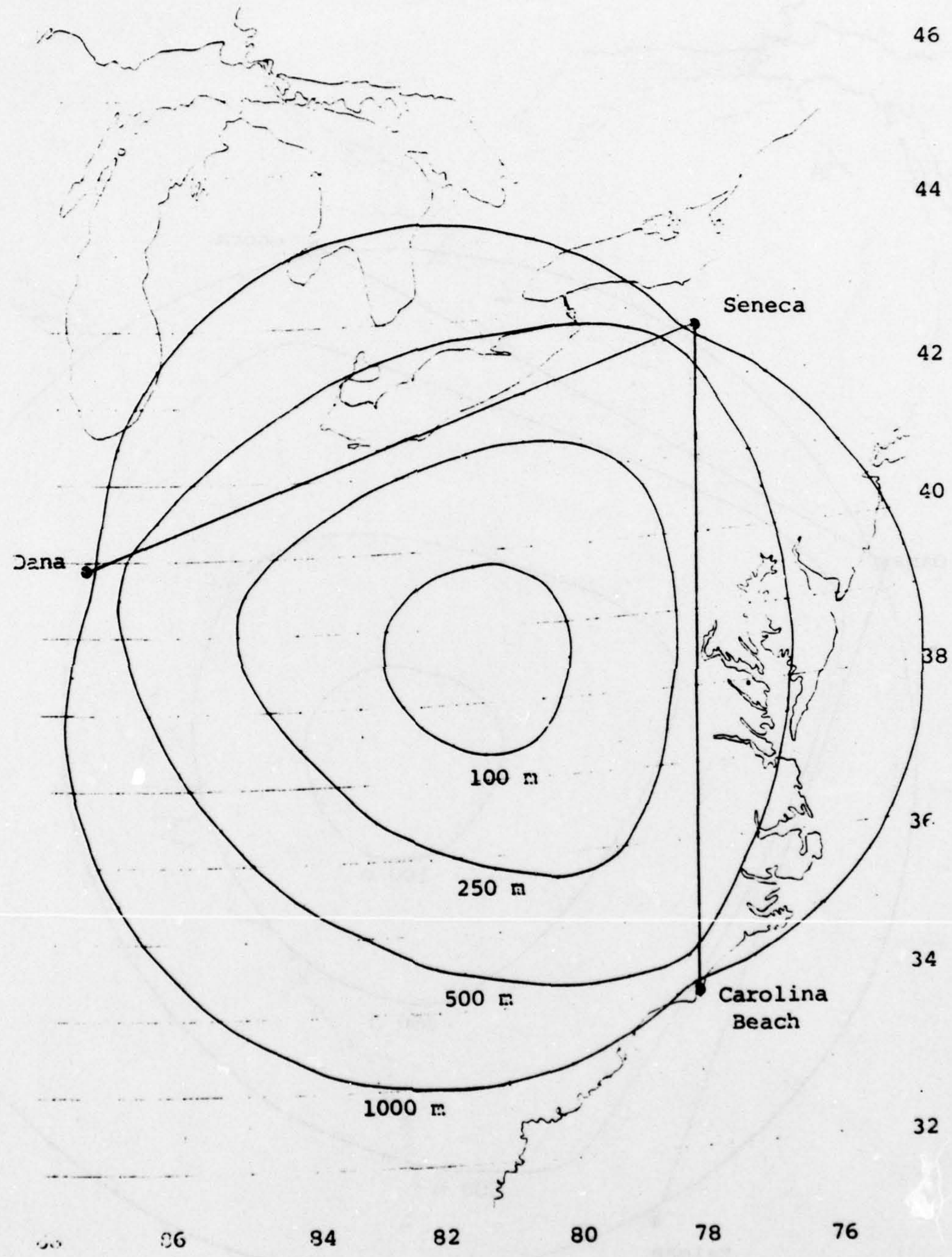


Figure A.4 Theoretical Grid Bias Error for Seneca, Dana and Carolina Beach

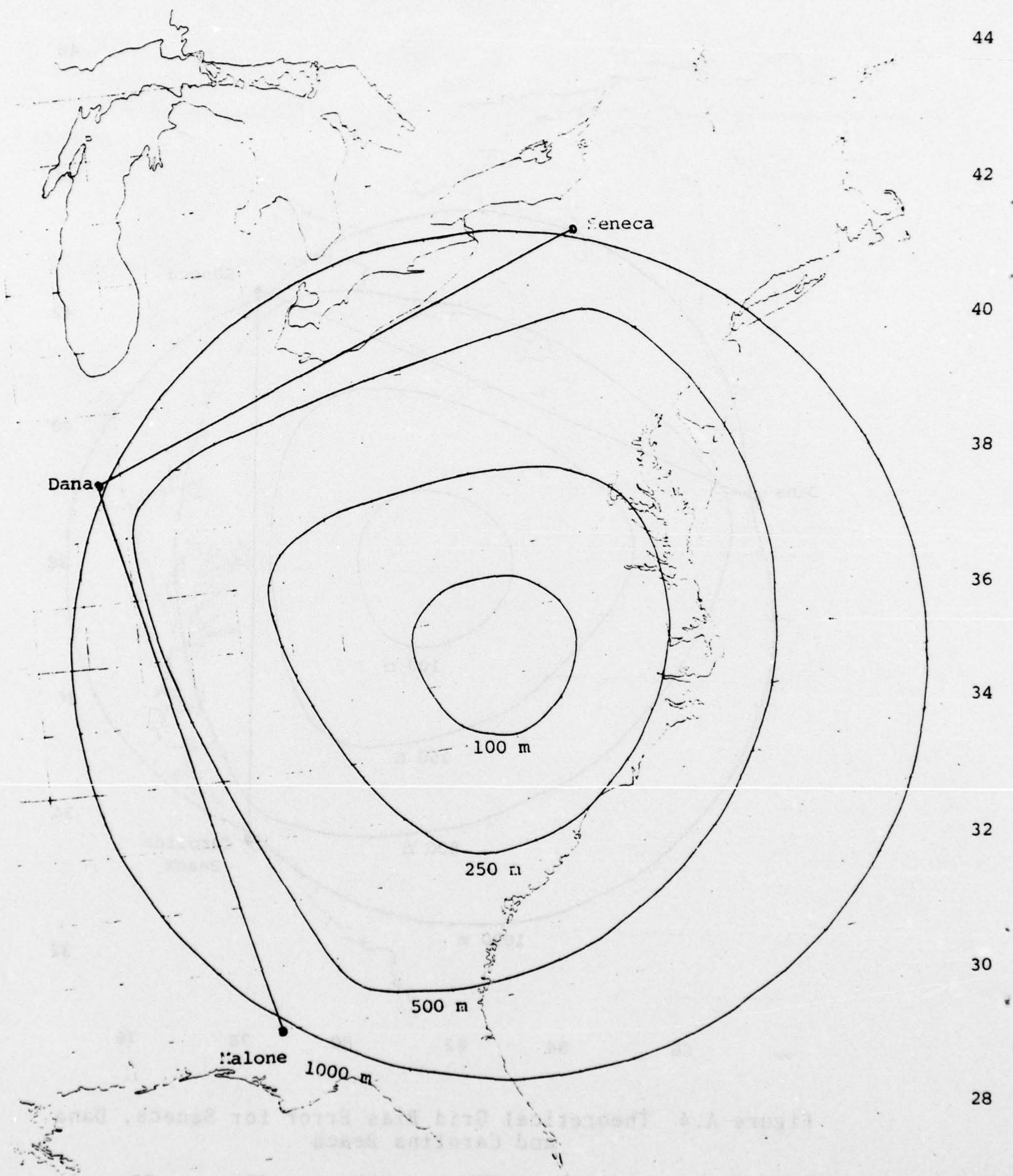


Figure A.5 Theoretical Grid Bias Error for Dana, Seneca and Malone

Grid warpage errors created by conductivity and terrain variations along adjacent propagation paths have been investigated theoretically and experimentally. A series of such tests is described in Ref. 1 in which a Loran-C simulator was used to attempt to match "real world" data. Results of these tests are shown in Figures A.6 and A.7 which indicate the residual errors at several locations for the Carolina Beach - Jupiter and Carolina Beach - Dana time differences. The data is shown over a 20 by 25 nmi grid.

Grid warpage caused by other terrain irregularities, such as coastlines and mountains, has also been investigated. The U.S. Army Electroncis Command (ECOM) has investigated coastline effects in the Montauk Point, New Jersey area [2]. The results of this study are shown in Figures A.8 and A.9. The impact of mountainous terrain was studied by ECOM in the vicinity of Nittany Mountain near State College, Pennsylvania [2]. These results are shown in Figure A.10.

A.3 RECEIVER DYNAMIC ERROR ANALYSIS

Airborne Loran-C receiver systems have tracking loops which smooth the time difference information to reduce the effects of noise on the signal. These tracking loops can cause the receiver output signal to lag behind the input signal. Many tracking loops are designed as second order phase locked loops which produces zero lag as long as the aircraft is moving with constant velocity. Aircraft accelerations or turns can cause the lag to appear as a position error during these maneuvers. The amount of lag error can be estimated by considering the following example.

Assume the receiver tracking circuit is a second-order phase locked loop of the form

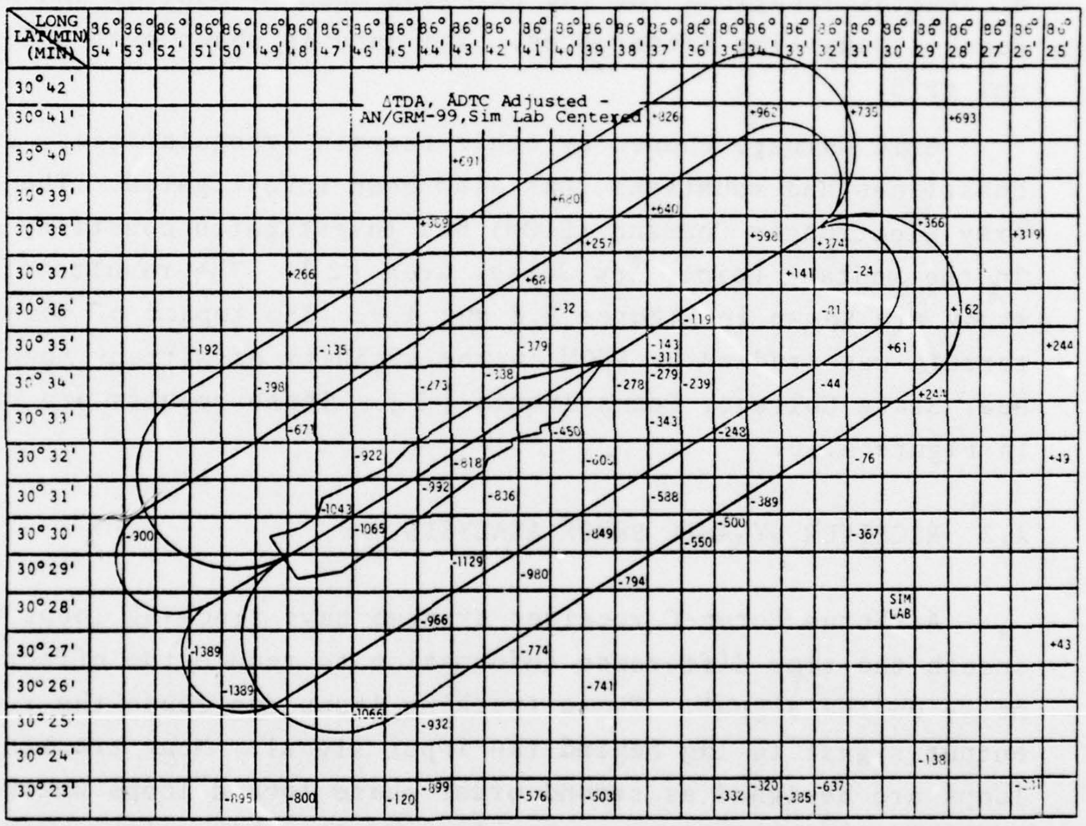


Figure A.6 Grid Warp Error at Eglin AFB, Carolina Beach - Jupiter (error in nanoseconds, zero error at simulation laboratory)

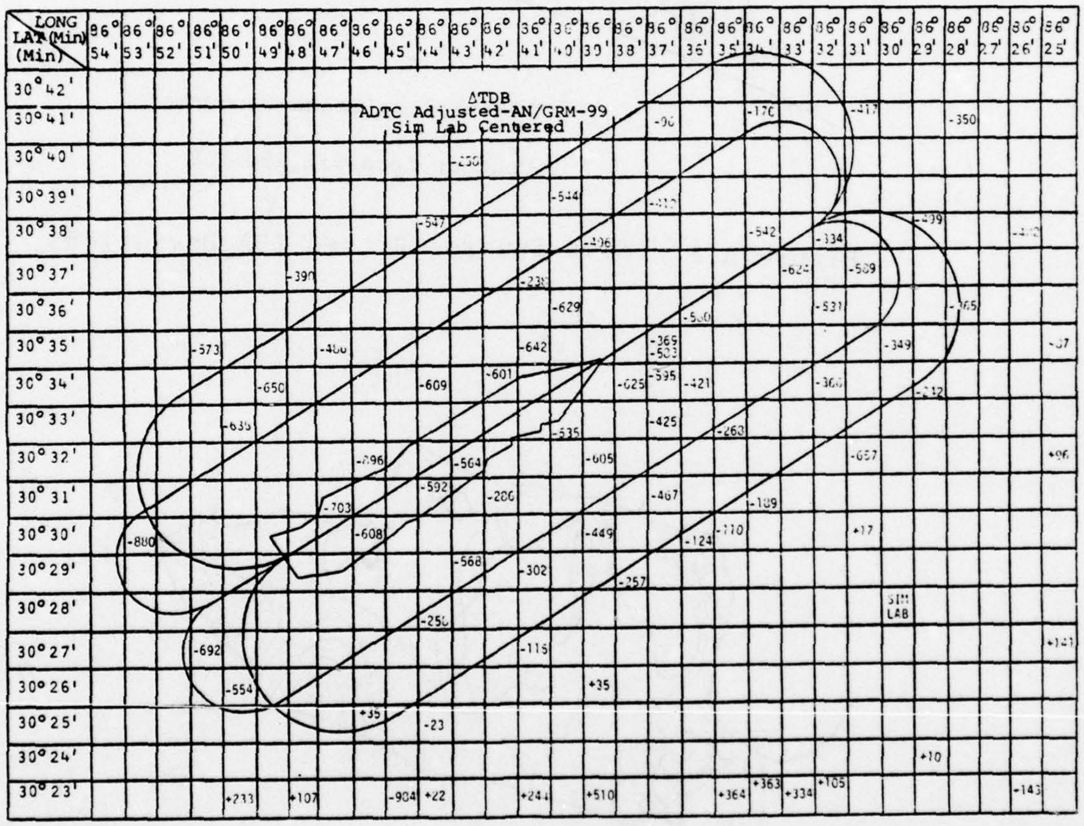
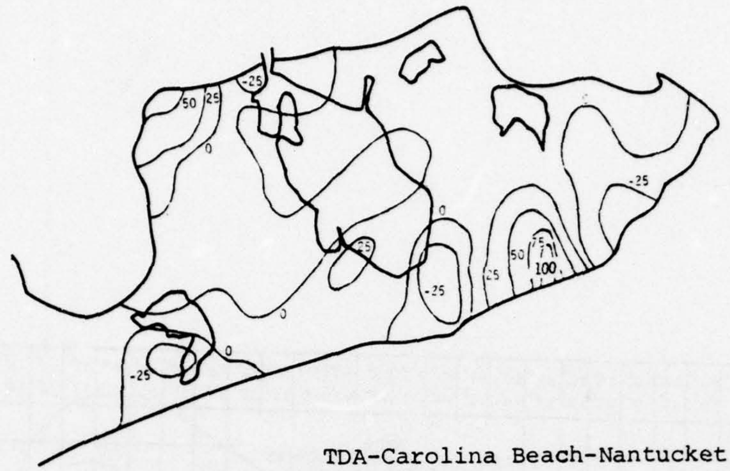


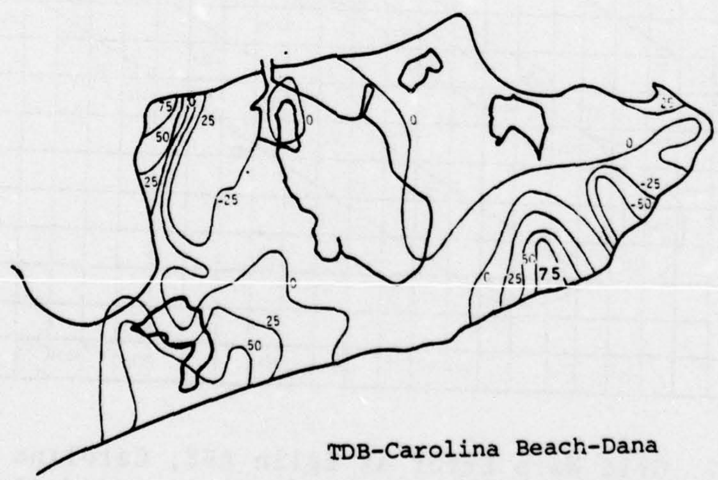
Figure A.7 Grid Warp Error at Eglin AFB, Carolina Beach - Dana (error in nanoseconds, zero error at simulation laboratory)



TDA-Carolina Beach-Nantucket

Contour Interval.25μSECS

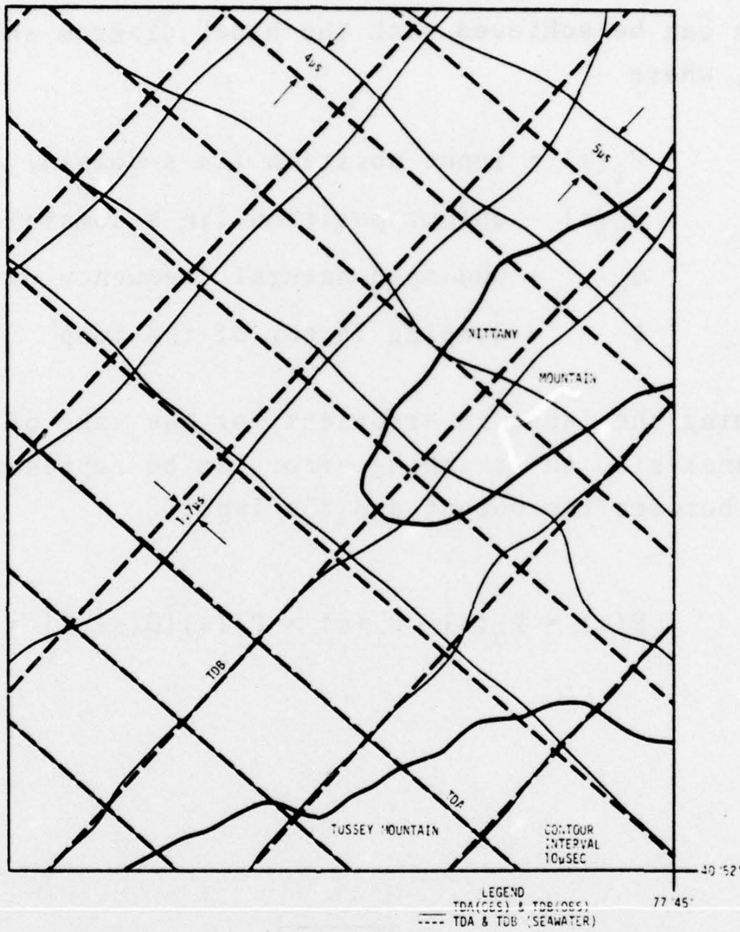
Figure A.8 Least-Squares Fitted TDA Deviations



TDB-Carolina Beach-Dana

Contour Interval.25μSECS

Figure A.9 Least-Squares Fitted TDB Deviations



TDA-Carolina Beach-Nantucket
TDB-Carolina Beach-Dana

Figure A.10 Observed TDA and TDB Superimposed on Loran Seawater Grid

$$\frac{P_o(s)}{P_i(s)} = H(s) = \frac{2\xi\omega_n S + \omega_n^2}{S^2 + 2\xi\omega_n S + \omega_n^2}$$

which can be achieved with the block diagram shown in Figure A.11, where

$P_i(s)$ = input position (in s-domain)

$P_o(s)$ = output position (in s-domain)

ω_n = undamped natural frequency of the loop

ξ = damping factor of the loop

Assuming the input is errorless for the sake of the dynamic accuracy analysis, the tracking error can be represented by the difference between the output and the input

$$E(s) = P_o(s) - P_i(s) = P_i(s)[H(s)-1] = \frac{-S^2 P_i(s)}{S^2 + 2\xi\omega_n S + \omega_n^2}$$

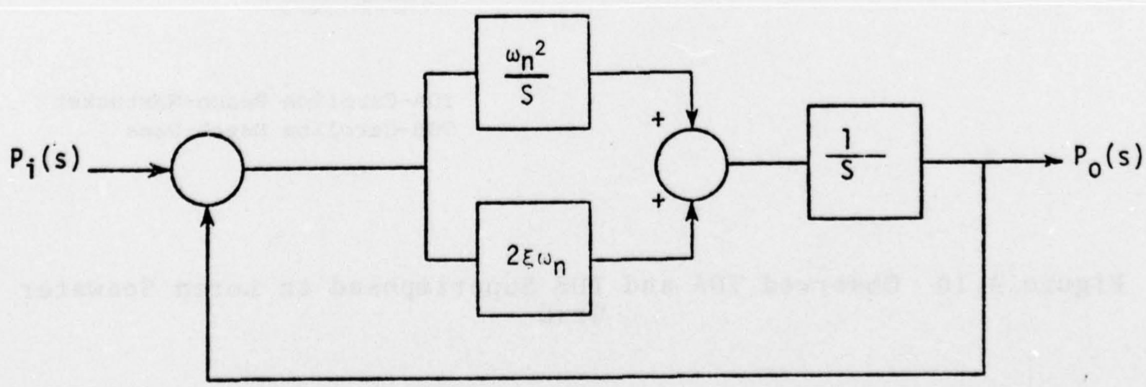


Figure A.11 Receiver Tracking Loop Block Diagram

Assume that prior to time t=0 the aircraft is flying along the Loran-C line-of-position (LOP) and at time t=0 the aircraft begins a turn in a circular arc away from the LOP with velocity V and turn rate ω. The position of the aircraft with respect to the LOP is then

$$P_i(t) = 0 \qquad t \le 0$$

$$P_i(t) = \frac{V}{\omega}\,(1 - \cos \omega t) \qquad t > 0$$

For small t the position is approximately

$$P_i(t) \cong \frac{V}{\omega}\,\frac{(\omega t)^2}{2} = \omega V\,\frac{t^2}{2} = A\,\frac{t^2}{2}$$

where $A = \omega V$ is the acceleration experienced by the aircraft in the direction perpendicular to the flight path of the aircraft. In the s-domain,

$$P_i(s) = \frac{A}{S^3}\ .$$

and the resulting error is

$$E(s) = \frac{-A}{S(S^2 + 2\xi\omega_n S + \omega_n^2)}$$

By applying the final value theorem [3] to $E(s)$, the peak steady state error can be found (since A is the maximum acceleration experienced by the aircraft). The final value theorem states that the steady state error E_{ss} can be found by the following expression

$$E_{ss} = \lim_{s \to o} \frac{-As}{s(s^2 + 2\xi\omega_n s + \omega_n^2)} = \frac{-A}{\omega_n^2}$$

The minus sign indicates that the output lags the input. The term $\frac{1}{\omega_n}$ is often replaced by the filter time constant τ in which case the steady state error becomes

$$E_{ss} = -A\tau^2 .$$

A.4 LORAN-C COVERAGE

The two factors that define the limits of Loran-C coverage for a triad (master and two secondary stations) are signal availability and position determination accuracy. The signal availability factor is commonly considered to be a signal-to-noise level value that permits a receiver to acquire and process the Loran-C signals a high percentage of the time. At the present time, the U.S. Coast Guard considers the limits of coverage for civilian users to be a groundwave signal-to-noise level of 1:3 (-10 dB) which is available 95% of the time. The position determination limitations are based upon the accuracy with which two time difference values may be converted to a geographical position fix. This accuracy is determined by the repeatability of the time difference measurement and the geometric dilution of precision (GDOP) factor that relates time differences to geographical position. The U.S. Coast Guard uses a root-mean-square radial error (DRMS) statistic to define accuracy limits. A 2 DRMS value of 1500 ft defines the coverage limits published by the U.S. Coast Guard.

A.4.1 Atmospheric Noise

The atmospheric noise values that are often used in coverage calculations are defined from Ref. 4. Contours of expected noise levels at 1 MHz are presented along with curves to translate the contour values to other frequencies from 10 KHz to about

20 MHz. Curves of statistical characteristics of the atmospheric noise are also presented for the same frequency range. Contours are presented for four seasons in six daily time periods of four hours each. The methods by which these noise data are used to determine a noise figure for the specific area of interest is described in detail in Appendix B of Ref. 5.

A.4.2 Signal Strength

The signal strength of low frqeuency groundwaves was computed for various ground conductivities as shown in Figure A.12. It is evident from these curves that the earth's conductivity has a significant influence on the field strength. In addition, at distances greater than 200 nautical miles, the curves decay at a rate that is considerably in excess of the classical inverse distance relationship normally associated with field strength. Consequently in this region, boosting transmitter power will produce only small increases in reception range.

Traditional use of Loran-C has been over sea water which has a conductivity of 5 mhos/meter which nearly overlies the $\sigma = \infty$ curve in Figure A.12. The use of Loran-C over land areas, which generally have conductivities ranging from $\sigma = .0001$ mho/meter to $\sigma = .0100$ mho/meter, will result in decreased signal strength and consequently reduced reception range as compared to sea water applications. For instance, the theoretical range from a 100 KW transmitter in the northeastern United States is about 870 nm over seawater, 790 nm over cultivated land and only 490 nm over poor, rocky soil. Doubling the transmitter power to 200 KW will produce range increases of about 10% in each case. Thus in order to significantly increase transmitter range over land, very large increases in transmitter power are required. The alternative solution to increasing power is achieved by using closer spaced transmitters and more ground stations.

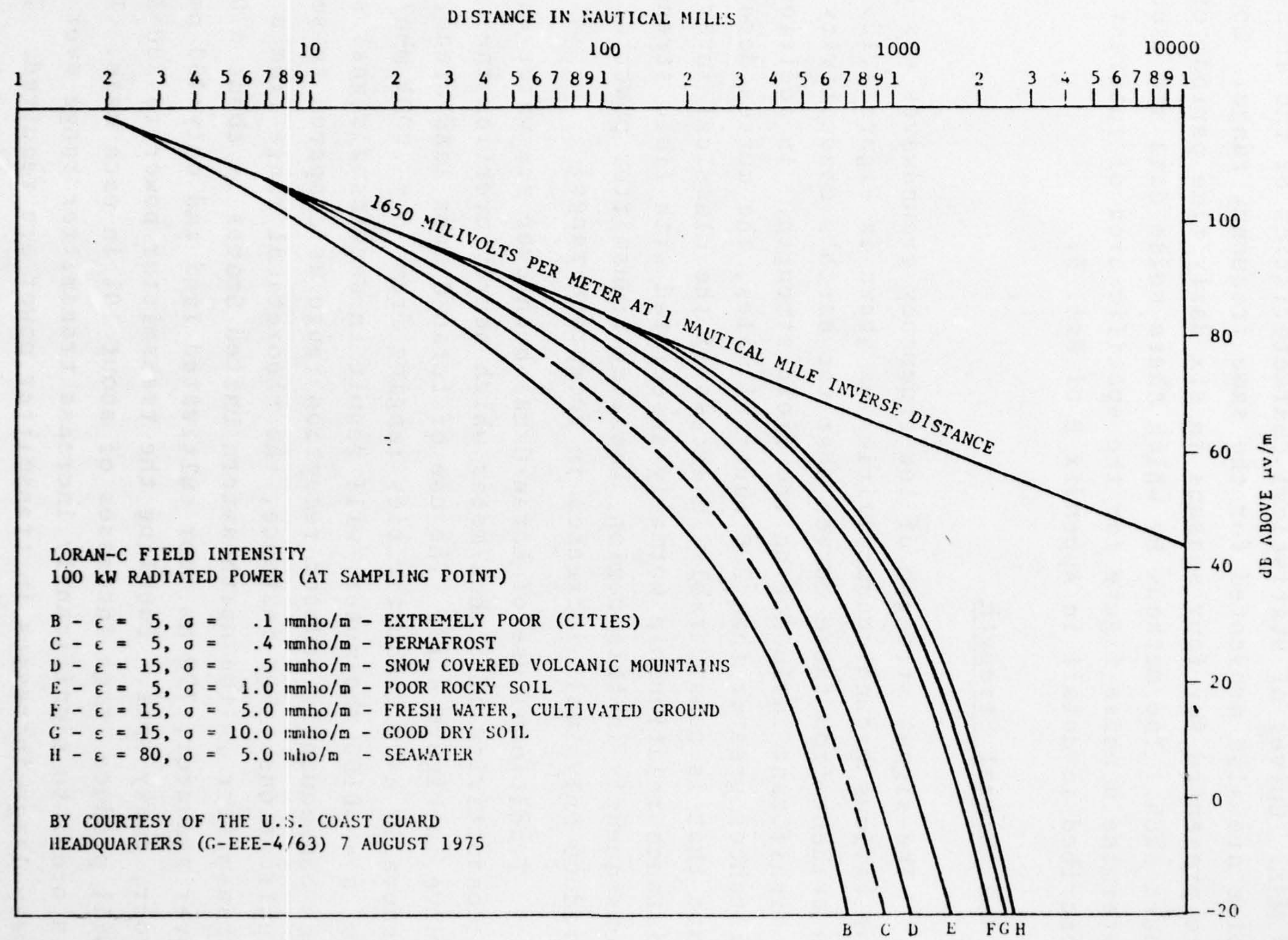


Figure A.12 Loran-C Field Strenght as a Function of Distance from the Transmitter

The use of Loran-C in land areas often means that the path between the transmitter and receiver has more than one conductivity value. The analysis of signal strength over these mixed conductivity paths requires specialized computer software to accurately model the process [6] or empirical techniques which use the data associated with Figure A.12 [7]. This empirical approach is discussed in greater detail in Section A.5.

A.4.3 Signal-to-Noise Ratio Computations

The signal strength values that are characterized by Figure A.12 are compared to the noise levels obtained from Ref. 4. At points where the signal-to-noise ratio is greater than 1:3 (-10 dB) from all three stations in the Loran-C triad, the signal availability criteria for coverage is met. Points where the signal-to-noise ratio is less than 1:3 are considered to be outside the coverage area of the stations under consideration.

A.4.4 GDOP Considerations

The GDOP expressions determine the ratio by which time difference error is propagated into position fix error. The GDOP value is dependent only upon the geometric relationships between the three Loran-C stations and the point of interest. The two terms which compose the GDOP factor are the gradients of the LOP's and the crossing angle of the LOP's. The gradient of each LOP depends upon the user's position. Along the baseline the gradient of the LOP is a minimum and has the value of 150 meters/μs (492 ft/μs). Along the baseline extension the gradient is infinitely large as there is no change in the time difference reading anywhere along this line. As the user approaches a baseline extension, the GDOP factor gets very large and an accurate position fix cannot be determined.

The other geometric characteristic that affects the GDOP factor is the crossing angle of the LOP's. The GDOP term is inversely proportional to the sine of the crossing angle of the LOP's [8] and is thus a minimum where the LOP's cross at 90° and a maximum where the LOP's cross at 0° or 180°. The line on which the LOP's cross at 0° or 180° is an extension of the line connecting the two secondary stations. Thus, the areas where no coverage can be expected due to GDOP factors are the baseline extension areas from lines connecting all three stations in the triad.

A.5 EXAMPLE TRANSMITTER RANGE ANALYSIS

The range of an LF transmitter is a function of the transmitter power, the conductivity of the surface over which the electromagnetic wave travels and the noise environment at the receiver. Over constant conductivity surfaces, curves such as those shown in Figure A.12 can be used to compute the field strength of the transmitted signal at any distance from the station. In mixed conductivity regions the analysis of field strength and transmitter range is complicated by the differing attenuation rates of the signal as it passes over the various conductive regions. Millington [9] as discussed in Scott [10] has developed a semi-empirical method for computing the field strength in such areas. Let the path under consideration be as shown in Figure A.13.

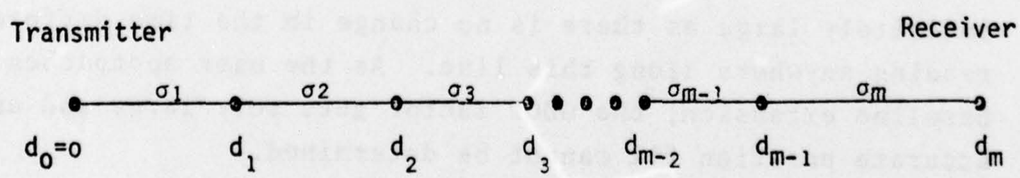


Figure A.13 Propagation Path with Mixed Conductivities

Let $E(\sigma,d)$ represent the field strength functions as shown in Figure A.1 in terms of attenuation in dB's. Millington's method assumes that the field strength of the transmitted signal at point d_m is the geometric mean of the path from d_o to d_m and the reciprical path from d_m to d_o. The forward path may be computed as

$$E_F = E(\sigma_1,d_1)+[E(\sigma_2,d_1)-E(\sigma_2,d_1)]+[E(\sigma_3,d_3)-E(\sigma_3,d_2)]$$

$$+\ldots+ [E(\sigma_{m-1},d_{m-1})-E(\sigma_{m-1},d_{m-2})]$$

$$+ [E(\sigma_m,d_m)-E(\sigma_m,d_{m-1})]$$

and the backward path may be computed as

$$E_B = E(\sigma_m,d_m-d_{m-1})+[E(\sigma_{m-1},d_m-d_{m-2})-E(\sigma_{m-1},d_m-d_{m-1})]$$

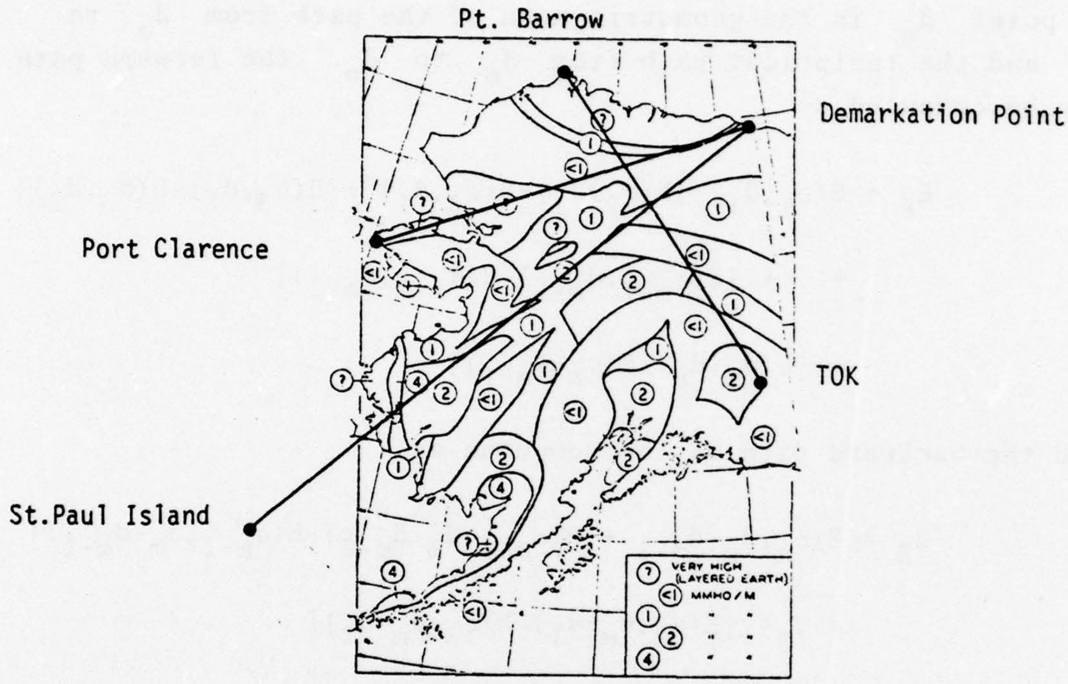
$$+\ldots+ [E(\sigma_2,d_m-d_1)-E(\sigma_2,d_m-d_2)]$$

$$+ [E(\sigma_1,d_m-d_o)-E(\sigma_1,d_m-d_1)]$$

and the mean field strength, E, can be found by averaging E_F and E_B since both are in terms of decibels

$$E = \frac{1}{2}(E_F + E_B)$$

Millington's method was applied to several points in Alaska in order to determine the range of the Loran-C signal. Conductivity values were taken from a map (Figure A.14) prepared by Stanley [11] as found in Ref. 12. Attenuation values were computed by fitting the data represented in Figure A.1 (as found in Ref. 8) to a second degree polynomial of the form $E = A + Bd + Cd^2$ where d is in nautical miles and E is measured in terms of dB relative to 1v/meter. The curve fits for the various conductivities



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Note: In areas represented by <1, a value of 0.5 m mho/m was used. In areas represented by "?", a value of 50 m mho/m was assumed.

Figure A.14 Alaskan Ground Conductivities at LF (millimhos/m)

were accurate to about 2 dB in the 60-80 nm range and the accuracy improved to less than 0.5 dB error in the region beyond 800 nm. The errors in all curves were similar in value and of the same sign at the same distance values so that error cancellation would occur at the shorter ranges due to the formulation of Millington's method.

Three paths were chosen for detailed evaluation. These paths are:

A - St. Paul Island to Demarkation Point

B - Tok to Point Barrow

C - Port Clarence to Demarkation Point

The following conductivity-distance values were used in the analysis:

Path A

Seg.	d	σ
1	303	5 mho/m
2	764	0.002
3	876	0.001
4	1067	0.0005

Path B

Seg.	d	σ
1	53	0.002 mho/m
2	106	0.0005
3	202	0.001
4	276	0.0005
5	329	0.001
6	414	0.0005
7	446	0.001
8	574	0.05

Path C

Seg.	d	σ
1	79	0.0005 mho/m
2	147	5.0
3	305	0.05
4	645	0.0005

The computation of the field strength produced the following data:

Path	Field Strength (dB above 1 v/m)
A	24.9 dB
B	51.5 dB
C	41.6 dB

The noise level used by the Coast Guard for range calculations in the Gulf of Alaska Chain is 42 dB above 1 v/meter in a 20 kHz bandwidth. The resulting signal-to-noise ratios are:

Path	S/N
A	-17.1 dB
B	+9.5 dB
C	-0.4 dB

The path A S/N falls well below the Coast Guard threshold value of -10 dB for civil systems. Paths B and C are well above the -10 dB threshold. Thus Demarkation Point is outside of the coverage area for St. Paul Island while Pt. Barrow is within the coverage of Tok and Demarkation Point is within the coverage of Port Clarence.

A.6 LORAN-C CHAINS

The coordinates, station function, coding delay, baseline length and radiated peak power of each of the Loran-C chains are presented in Tables A.1 through A.9. These include the U.S. West Coast chain, West Canadian chain, North Pacific chain, Gulf of Alaska chain, U.S. East Coast chain, Gulf of Mexico chain, Great Lakes chain, mid-continent chain and current Alaskan chain. The operational date of each of the chains is also noted for reference.

Table A.1

U.S. West Coast Chain (Operation 1/77) - Rate 9940

Station	Coordinates Latitude & Longitude	Station Function	Coding Delay & Baseline Length	Radiated Peak Power
Fallon, Nevada	39-33-06.38N 118-49-45.20W	Master	---	400 kW
George, Washington	47-03-47.90N 119-44-39.38W	W Secondary	11,000μs 2796.92μs	2.0 MW
Middletown, California	38-46-56.76N 122-29-44.30W	X Secondary	27,000μs 1094.50μs	400 kW
Searchlight, Nevada	34-19-18.11N 114-48-17.35W	Y Secondary	40,000μs 1967.28μs	1.0 MW

Table A.2

West Canadian Chains (Operation 1/77) - Rate 5990

Station	Coordinates Latitude & Longitude	Station Function	Coding Delay & Baseline Length	Radiated Peak Power
Williams Lake BC, Canada	51-57-58.70N 122-22-02.50W	Master	---	400 kW
Shoal Cove, Alaska	55-26-20.68N 131-15-19.69W	X Secondary	11,000μs 2343.58μs	1.0 NW
George, Washington	47-03-47.90N 119-44-39.38W	Y Secondary	27,000μs 1927.37μs	2.0 MW

Table A.3

North Pacific Chain (Reconfigured 1/77) - Rate 9990

Station	Coordinates Latitude & Longitude	Station Function	Coding Delay & Baseline Length	Radiated Peak Power
St. Paul Is., Pribiloff Is., Alaska	57-08-09.80N 170-14-59.84W	Master	---	300 kW
Attu, Alaska	52-49-44.96N 173-10-42.31E	X Secondary	11,000μs 3875.32μs	300 kW
Port Clarence, Alaska	65-14-40.06N 166-53-14.47W	Y Secondary	29,000μs 3069.09μs	1.0 MW
Narrow Cape, Alaska	57-26-20.48N 152-22-11.98W	Z Secondary	43,000μs 3590.06μs	400 kW

Table A.4

Gulf of Alaska Chain (Operation 1/77) - Rate 7960

Station	Coordinates Latitude & Longitude	Station Function	Coding Delay & Baseline Length	Radiated Peak Power
Tok, Alaska	63-19-42.70N 142-48-33.30W	Master	---	1.0 MW
Narrow Cape, Alaska	57-26.20.48N 152-22-11.98W	X Secondary	11,000μs 2804.40μs	400 kW
Shoal Cove, Alaska	55-26-20.68N 131-15-19.69W	Y Secondary	26,000μs 3651.18μs	1.0 MW

Table A.5

U.S. East Coast Chain (Reconfigured 7/78) - Rate 5930

Station	Approximate Latitude & Longitude	Station Function	Coding Delay & Baseline Length	Radiated Peak Power
Seneca, New York	42-42-53N 76-49-35W	Master	---	1.0 NW
Caribou, Maine	46-48-27.90N 67-55-37.97W	W Secondary	11,000μs	700 KW
Nantucket, Massachusetts	41-15-11.84N 69-58-39.09W	X Secondary	25,000μs	300KW
Carolian Beach, N. Carolina	34-03-45.96N 77-54-46.76W	Y Secondary	39,000μs	350KW

Table A.6

Gulf of Mexico Chain (Operational 7/78)

Station	Approximate Latitude & Longitude	Station Function	Coding Delay & Baseline Length	Radiated Peak Power
Malone, Florida	30-59-38N 85-10-11W	Master	---	1.0 MW
Grangeville, Louisiana	30-43-34N 90-49-41W	W Secondary	11,000μs	1.0 MW
Raymondville, Texas	26-31-54N 97-49-58W	X Secondary	23,000μs	400 kW
Jupiter, Florida	27-01-58.42N 80-06-53.52W	Y Secondary	41,000μs	300 kW
Carolina Beach, N. Carolina	34-02-45.96N 77-54-46.76W	Z Secondary	59,000μs	350 kW

Table A.7

Great Lakes Chain (Operational 2/80) - Rate 9960

Station	Approximate Latitude & Longitude	Station Function	Coding Delay & Baseline Length	Radiated Peak Power
Dana, Indiana	39-51-07.46N 87-29-12.14W	Master	---	400 kW
Malone, Florida	30-59-38N 85-10-11W	W Secondary	11,000μs	1.0MW
Seneca, New York	42-42-53N 79-49-35W	X Secondary	28,000μs	1.0MW
Int. Falls, Minnesota	48-36N 93-22W	Y	44,000μs	1.0MW

Table A.8

U.S. Mid-Continent Chain (Proposed)

Station	Approximate Latitude & Longitude	Station Function	Coding Delay & Baseline Length	Radiated Peak Power
Springfield, Colorado	37-25 N 102-39 W	Master		1.0MW
Harlem, Montona	48-31 N 108-49 W	Secondary		1.0MW
Terlingua, Texas	29-18 N 103-38 W	Secondary		400 kW

Table A.9

Current Alaskan Loran-C Chains

North Pacific Chain

Station	Coordinates	Station Function	Peak Power
St Paul Is	57-09-09.80N 170-14-59,84W	Master	300 KW
Attu	52-49-44.96N 173-10-52.31E	x Secondary	300 KW
Port Clarence	65-14-40.06N 166-53-14.47W	y Secondary	1.0 MW
Narrow Cape	57-26-20.48N 152-22-11.98W	z Secondary	400 KW

Gulf of Alaska Chain

Station	Coordinates	Station Function	Peak Power
Tok	63-19-42.70N 142-48-33.30W	Master	1.0 MW
Narrow Cape	57-26-20.48N 152-22-11.98W	x Secondary	400 KW
Shoal Cove	55-26-20.68N 131-15-19.69W	y Secondary	1.0 MW

APPENDIX B

OMEGA ACCURACY

The purpose of this appendix is to present the results of the Omega accuracy analysis in the CONUS, Alaska and offshore regions. The results are presented as a series of tables describing the primary dimensions of the error ellipse at various latitude/longitude grid points. In these tables, dimension A is the semi-major axis, dimension B is the semi-minor axis and Φ(PHI) is the bearing relative to North, of the semi-major axis. The axes dimensions are given in nautical miles and the bearing is given in degrees.

Table B.1 represents the results for the pessimistic coverage case where, for the major part, only three stations are available. In the optimistic coverage situation more stations are available. Hence, it is desirable to determine achievable accuracies for various station combinations. Table B.2 shows the situation when all stations are operating and being used according to the optimistic predictions. Loss of a single station, taken sequentially, is shown in Tables A.3 through A.7. Finally, for the optimistic coverage situation, Tables A.8 through A.17 show the expected accuracies in the event of the loss of two stations simultaneously.

The next accuracy computations of interest are for Omega utilization in the ρ/ρ mode. This mode requires the addition of an accurate onboard clock. Clock errors are not included in these computations and would have to be added. Table A.18 indicates the expected accuracies for the ρ/ρ mode using stations C and D only. Advancing to using all dual combinations of Omega when more than two are available the accuracies are determined to be those given in Tables B.19 through B.27. Using combinations of these the accuracies are given in Tables B.28 through B.37. Tables B.38 through B.42 show ρ/ρ accuracies for combinations of four and Table B.43 shows the expected accuracy when five stations are available and being used.

The expected accuracies for the pessimistic coverage prediction for Alaska and Alaska offshore are shown in Tables B.44 through B.59 Table B.44 shows the accuracies for five Omega stations, Tables B.45 through B.49 show the accuracies for combinations of four out of the possible five and Tables B.50 through B.59 show the accuracies when two of the five available stations are not being used. Finally, Table B.60 and B.61 indicate the accuracies for all stations available for the optimistic coverage prediction in Alaska.

TABLE B.1

ACCURACIES FOR CONUS PESSIMISTIC COVERAGE PREDICTION

STATIONS AVAILABLE	LAT	LON	A (NMI)	B (NMI)	PHI (DEG)
CDH	49	105	1.612	.764	25.7
		115	1.536	.766	156.3
		125	1.443	.775	145.0
	45	105	1.792	.781	157.8
		115	1.662	.769	153.4
		125	1.536	.722	145.5
	40	105	3.074	.865	162.3
		115	1.963	.798	149.7
		125	1.740	.779	145.7
	35	105	3.927	.954	155.8
		115	2.884	.826	165.1
	30	105	4.706	1.024	153.7
BCD	45	75	56.252	.707	12.9
		85	11.988	.708	7.4
	40	78	5.073	.714	14.9
ABCD	40	75	1.185	.597	113.0
BCD	40	75	6.195	.712	16.1
ACD	40	75	8.756	.923	160.0
ABD	40	75	1.663	.820	108.1
ABC	40	75	1.387	.823	111.0
CDF	25	75	1.284	.933	73.8
		85	1.309	.860	83.1
		95	1.374	.796	186.0

TABLE B2 STATIONS CDFGH

```
Lat = 25   lon = 75   A = .980898   B = .556159   Phi(1,n) = 162.61
Lat = 25   lon = 85   A = .918276   B = .54918    Phi(1,n) = 174.414
Lat = 25   lon = 95   A = .856417   B = .534577   Phi(1,n) = 187.764
Lat = 25   lon =105   A = .78363    B = .525339   Phi(1,n) = 199.562
Lat = 25   lon =115   A = .619185   B = .584509   Phi(1,n) = 177.312
Lat = 25   lon =125   A = .634785   B = .557614   Phi(1,n) = 146.183
Lat = 30   lon = 75   A = .973261   B = .570022   Phi(1,n) = 156.684
Lat = 30   lon = 85   A = .915107   B = .560398   Phi(1,n) = 168.533
Lat = 30   lon = 95   A = .856879   B = .53746    Phi(1,n) = 184.183
Lat = 30   lon =105   A = .624352   B = .602037   Phi(1,n) = 86.6036
Lat = 30   lon =115   A = .61769    B = .575665   Phi(1,n) = 163.882
Lat = 30   lon =125   A = .649168   B = .541402   Phi(1,n) = 149.177
Lat = 35   lon = 75   A = .97163    B = .586272   Phi(1,n) = 149.806
Lat = 35   lon = 85   A = .928539   B = .57365    Phi(1,n) = 160.65
Lat = 35   lon = 95   A = .860085   B = .542436   Phi(1,n) = 179.804
Lat = 35   lon =105   A = .646867   B = .572909   Phi(1,n) = 185.001
Lat = 35   lon =115   A = .634665   B = .553035   Phi(1,n) = 155.519
Lat = 35   lon =125   A = .666353   B = .527312   Phi(1,n) = 149.856
Lat = 40   lon = 75   A = 1.04405   B = .588884   Phi(1,n) = 143.385
Lat = 40   lon = 85   A = .974302   B = .587841   Phi(1,n) = 148.929
Lat = 40   lon = 95   A = .875739   B = .553013   Phi(1,n) = 172.165
Lat = 40   lon =105   A = .627831   B = .568252   Phi(1,n) = 175.878
Lat = 40   lon =115   A = .698313   B = .513081   Phi(1,n) = 135.587
Lat = 40   lon =125   A = .739021   B = .497826   Phi(1,n) = 133.144
Lat = 45   lon = 75   A = .913016   B = .634093   Phi(1,n) = 114.321
Lat = 45   lon = 85   A = .931981   B = .626517   Phi(1,n) = 113.373
Lat = 45   lon = 95   A = 1.02647   B = .583708   Phi(1,n) = 140.867
Lat = 45   lon =105   A = .736238   B = .498516   Phi(1,n) = 144.714
Lat = 45   lon =115   A = .783862   B = .487056   Phi(1,n) = 142.337
Lat = 45   lon =125   A = .790709   B = .487515   Phi(1,n) = 135.268
Lat = 49   lon = 75   A = .909392   B = .635835   Phi(1,n) = 102.996
Lat = 49   lon = 85   A = 1.08268   B = .59504    Phi(1,n) = 112.275
Lat = 49   lon = 95   A = 1.58356   B = .533073   Phi(1,n) = 87.8258
Lat = 49   lon =105   A = .991895   B = .471086   Phi(1,n) = 28.1384
Lat = 49   lon =115   A = .87761    B = .477053   Phi(1,n) = 150.112
Lat = 49   lon =125   A = .827688   B = .486083   Phi(1,n) = 139.033
```

TABLE B3 STATIONS DFGH (STATION C IS OUT)

Lat = 25	lon = 75	A = 1.81104	B = .580086	Phi(1,n) = 85.7428
Lat = 25	lon = 85	A = 1.67401	B = .572578	Phi(1,n) = 87.4493
Lat = 25	lon = 95	A = 1.53712	B = .560622	Phi(1,n) = 98.2248
Lat = 25	lon =105	A = 1.28894	B = .55945	Phi(1,n) = 112.377
Lat = 25	lon =115	A = 1.14125	B = .56364	Phi(1,n) = 126.064
Lat = 25	lon =125	A = 1.08032	B = .566951	Phi(1,n) = 136.298
Lat = 30	lon = 75	A = 1.76111	B = .593495	Phi(1,n) = 84.3269
Lat = 30	lon = 85	A = 1.61168	B = .584979	Phi(1,n) = 83.8253
Lat = 30	lon = 95	A = 1.54268	B = .564552	Phi(1,n) = 97.4123
Lat = 30	lon =105	A = 1.26459	B = .5606	Phi(1,n) = 115.949
Lat = 30	lon =115	A = 1.11651	B = .56485	Phi(1,n) = 132.377
Lat = 30	lon =125	A = 1.07725	B = .566404	Phi(1,n) = 142.896
Lat = 35	lon = 75	A = 1.69248	B = .611376	Phi(1,n) = 81.3794
Lat = 35	lon = 85	A = 1.6912	B = .595482	Phi(1,n) = 80.3176
Lat = 35	lon = 95	A = 1.55488	B = .570261	Phi(1,n) = 95.1925
Lat = 35	lon =105	A = 1.22229	B = .561964	Phi(1,n) = 122.145
Lat = 35	lon =115	A = 1.08984	B = .56604	Phi(1,n) = 142.026
Lat = 35	lon =125	A = 1.09619	B = .563125	Phi(1,n) = 151.389
Lat = 40	lon = 75	A = 1.55925	B = .635584	Phi(1,n) = 76.3884
Lat = 40	lon = 85	A = 1.73314	B = .614031	Phi(1,n) = 73.7776
Lat = 40	lon = 95	A = 1.58673	B = .581085	Phi(1,n) = 88.5126
Lat = 40	lon =105	A = 1.14893	B = .563645	Phi(1,n) = 135.629
Lat = 40	lon =115	A = 1.01516	B = .575984	Phi(1,n) = 158.135
Lat = 40	lon =125	A = 1.03746	B = .57249	Phi(1,n) = 164.466
Lat = 45	lon = 75	A = 1.34736	B = .668382	Phi(1,n) = 69.6909
Lat = 45	lon = 85	A = 1.45844	B = .655026	Phi(1,n) = 63.5797
Lat = 45	lon = 95	A = 1.77309	B = .619604	Phi(1,n) = 64.1595
Lat = 45	lon =105	A = 1.03782	B = .572134	Phi(1,n) = 174.778
Lat = 45	lon =115	A = 1.0709	B = .568768	Phi(1,n) = 179.553
Lat = 45	lon =125	A = 1.08904	B = .567369	Phi(1,n) = 178.038
Lat = 49	lon = 75	A = 1.21052	B = .690976	Phi(1,n) = 66.9511
Lat = 49	lon = 85	A = 1.20017	B = .694287	Phi(1,n) = 60.4983
Lat = 49	lon = 95	A = 1.03333	B = .716434	Phi(1,n) = 44.4549
Lat = 49	lon =105	A = 1.11778	B = .579735	Phi(1,n) = 216.371
Lat = 49	lon =115	A = 1.06846	B = .576496	Phi(1,n) = 41.4178
Lat = 49	lon =125	A = 1.05607	B = .576984	Phi(1,n) = 33.3584

TABLE B4 STATIONS CFGH (STATION D I S OUT)

```
Lat = 25   lon = 75   A = 1.52206   B = .656346   Phi(1,n) = 76.9456
Lat = 25   lon = 85   A = 1.55443   B = .654394   Phi(1,n) = 68.1148
Lat = 25   lon = 95   A = 1.59726   B = .65041    Phi(1,n) = 60.2964
Lat = 25   lon =105   A = 1.63905   B = .646078   Phi(1,n) = 53.5605
Lat = 25   lon =115   A = 1.66992   B = .6425     Phi(1,n) = 47.7979
Lat = 25   lon =125   A = 1.67998   B = .640451   Phi(1,n) = 42.8117
Lat = 30   lon = 75   A = 1.46538   B = .660368   Phi(1,n) = 76.3152
Lat = 30   lon = 85   A = 1.49638   B = .658385   Phi(1,n) = 67.4142
Lat = 30   lon = 95   A = 1.53113   B = .655144   Phi(1,n) = 59.4115
Lat = 30   lon =105   A = 1.55878   B = .652076   Phi(1,n) = 52.2919
Lat = 30   lon =115   A = 1.56826   B = .650341   Phi(1,n) = 45.9099
Lat = 30   lon =125   A = 1.54531   B = .651282   Phi(1,n) = 40.0172
Lat = 35   lon = 75   A = 1.4125    B = .664809   Phi(1,n) = 74.8432
Lat = 35   lon = 85   A = 1.44189   B = .662776   Phi(1,n) = 66.092
Lat = 35   lon = 95   A = 1.46788   B = .660399   Phi(1,n) = 58.0451
Lat = 35   lon =105   A = 1.48122   B = .658836   Phi(1,n) = 50.6563
Lat = 35   lon =115   A = 1.47113   B = .659333   Phi(1,n) = 43.7868
Lat = 35   lon =125   A = 1.42357   B = .66381    Phi(1,n) = 37.224
Lat = 40   lon = 75   A = 1.36568   B = .66926    Phi(1,n) = 72.4388
Lat = 40   lon = 85   A = 1.39157   B = .667433   Phi(1,n) = 64.106
Lat = 40   lon = 95   A = 1.40839   B = .666111   Phi(1,n) = 56.1695
Lat = 40   lon =105   A = 1.40892   B = .666232   Phi(1,n) = 48.6382
Lat = 40   lon =115   A = 1.38422   B = .669115   Phi(1,n) = 41.435
Lat = 40   lon =125   A = 1.32402   B = .677016   Phi(1,n) = 34.4647
Lat = 45   lon = 75   A = 1.32683   B = .673242   Phi(1,n) = 69.2065
Lat = 45   lon = 85   A = 1.34597   B = .672183   Phi(1,n) = 61.4868
Lat = 45   lon = 95   A = 1.3534    B = .67217    Phi(1,n) = 53.7861
Lat = 45   lon =105   A = 1.3435    B = .674073   Phi(1,n) = 46.2294
Lat = 45   lon =115   A = 1.30983   B = .679243   Phi(1,n) = 38.8401
Lat = 45   lon =125   A = 1.25688   B = .688241   Phi(1,n) = 32.0872
Lat = 49   lon = 75   A = 1.30108   B = .675966   Phi(1,n) = 66.2445
Lat = 49   lon = 85   A = 1.31284   B = .67597    Phi(1,n) = 59.0184
Lat = 49   lon = 95   A = 1.31295   B = .677176   Phi(1,n) = 51.5431
Lat = 49   lon =105   A = 1.29666   B = .680503   Phi(1,n) = 44.0245
Lat = 49   lon =115   A = 1.27703   B = .684497   Phi(1,n) = 37.2908
Lat = 49   lon =125   A = 1.25478   B = .689341   Phi(1,n) = 31.6578
```

TABLE B5 STATIONS CDGH (STATION F IS OUT)

Lat = 25	lon = 75	A = 6.76244	B = .872999	Phi(1,n) = 142.699
Lat = 25	lon = 85	A = 5.09961	B = .855056	Phi(1,n) = 148.058
Lat = 25	lon = 95	A = 3.68467	B = .785707	Phi(1,n) = 156.619
Lat = 25	lon =105	A = 2.61083	B = .712359	Phi(1,n) = 164.318
Lat = 25	lon =115	A = 2.12465	B = .663278	Phi(1,n) = 169.372
Lat = 25	lon =125	A = 1.90469	B = .63541	Phi(1,n) = 171.657
Lat = 30	lon = 75	A = 8.78434	B = .923348	Phi(1,n) = 134.65
Lat = 30	lon = 85	A = 6.3187	B = .894492	Phi(1,n) = 139.503
Lat = 30	lon = 95	A = 4.2355	B = .79218	Phi(1,n) = 150.973
Lat = 30	lon =105	A = 2.6408	B = .69329	Phi(1,n) = 161.713
Lat = 30	lon =115	A = 2.07052	B = .639811	Phi(1,n) = 167.786
Lat = 30	lon =125	A = 1.83926	B = .614563	Phi(1,n) = 169.304
Lat = 35	lon = 75	A = 6.71094	B = 1.00011	Phi(1,n) = 125.51
Lat = 35	lon = 85	A = 11.2597	B = .958297	Phi(1,n) = 129.629
Lat = 35	lon = 95	A = 5.18701	B = .809191	Phi(1,n) = 144.193
Lat = 35	lon =105	A = 2.52749	B = .669552	Phi(1,n) = 160.815
Lat = 35	lon =115	A = 1.9157	B = .61752	Phi(1,n) = 168.206
Lat = 35	lon =125	A = 1.69337	B = .599838	Phi(1,n) = 168.644
Lat = 40	lon = 75	A = 8.41301	B = 1.07585	Phi(1,n) = 125.491
Lat = 40	lon = 85	A = 9.26564	B = 1.07019	Phi(1,n) = 119.207
Lat = 40	lon = 95	A = 7.96739	B = .859006	Phi(1,n) = 133.857
Lat = 40	lon =105	A = 2.16347	B = .635151	Phi(1,n) = 164.39
Lat = 40	lon =115	A = 1.39178	B = .617365	Phi(1,n) = 159.022
Lat = 40	lon =125	A = 1.28618	B = .611249	Phi(1,n) = 154.263
Lat = 45	lon = 75	A = 15.6392	B = 1.10487	Phi(1,n) = 127.801
Lat = 45	lon = 85	A = 12.2067	B = 1.14383	Phi(1,n) = 120.803
Lat = 45	lon = 95	A = 10.1428	B = 1.13329	Phi(1,n) = 112.402
Lat = 45	lon =105	A = 1.31739	B = .611607	Phi(1,n) = 166.207
Lat = 45	lon =115	A = 1.24656	B = .610244	Phi(1,n) = 161.431
Lat = 45	lon =125	A = 1.19133	B = .613231	Phi(1,n) = 153.802
Lat = 49	lon = 75	A = 14.1739	B = 1.06299	Phi(1,n) = 126.651
Lat = 49	lon = 85	A = 10.1521	B = 1.04525	Phi(1,n) = 117.825
Lat = 49	lon = 95	A = 2.75167	B = .878691	Phi(1,n) = 95.4471
Lat = 49	lon =105	A = 1.19357	B = .629645	Phi(1,n) = 19.4267
Lat = 49	lon =115	A = 1.17162	B = .619896	Phi(1,n) = 164.657
Lat = 49	lon =125	A = 1.12376	B = .624816	Phi(1,n) = 156.158

TABLE B6 STATIONS CDFH (STAION G IS OUT)

Lat = 25	lon = 75	A = 1.20018	B = .668053	Phi(1,n) = 168.538
Lat = 25	lon = 85	A = 1.17491	B = .652086	Phi(1,n) = 181.553
Lat = 25	lon = 95	A = 1.16115	B = .626138	Phi(1,n) = 196.212
Lat = 25	lon =105	A = 1.1012	B = .607637	Phi(1,n) = 209.898
Lat = 25	lon =115	A = .790194	B = .687348	Phi(1,n) = 158.458
Lat = 25	lon =125	A = .782711	B = .674276	Phi(1,n) = 194.357
Lat = 30	lon = 75	A = 1.21749	B = .670048	Phi(1,n) = 161.449
Lat = 30	lon = 85	A = 1.17781	B = .656626	Phi(1,n) = 174.378
Lat = 30	lon = 95	A = 1.17898	B = .623087	Phi(1,n) = 191.763
Lat = 30	lon =105	A = .808963	B = .694921	Phi(1,n) = 152.583
Lat = 30	lon =115	A = .769501	B = .687444	Phi(1,n) = 156.861
Lat = 30	lon =125	A = .751105	B = .683966	Phi(1,n) = 119.241
Lat = 35	lon = 75	A = 1.23733	B = .673143	Phi(1,n) = 152.513
Lat = 35	lon = 85	A = 1.20122	B = .661326	Phi(1,n) = 164.144
Lat = 35	lon = 95	A = 1.19414	B = .622415	Phi(1,n) = 186.051
Lat = 35	lon =105	A = .827467	B = .66979	Phi(1,n) = 150.258
Lat = 35	lon =115	A = .724496	B = .708713	Phi(1,n) = 161.627
Lat = 35	lon =125	A = .749734	B = .67595	Phi(1,n) = 140.762
Lat = 40	lon = 75	A = 1.25204	B = .677769	Phi(1,n) = 141.341
Lat = 40	lon = 85	A = 1.23721	B = .669455	Phi(1,n) = 148.769
Lat = 40	lon = 95	A = 1.20396	B = .629036	Phi(1,n) = 176.129
Lat = 40	lon =105	A = .785625	B = .672704	Phi(1,n) = 217.864
Lat = 40	lon =115	A = .843019	B = .624447	Phi(1,n) = 119.987
Lat = 40	lon =125	A = .890423	B = .60578	Phi(1,n) = 121.536
Lat = 45	lon = 75	A = 1.04168	B = .731866	Phi(1,n) = 36.9903
Lat = 45	lon = 85	A = 1.00962	B = .744437	Phi(1,n) = 38.2877
Lat = 45	lon = 95	A = 1.25959	B = .666822	Phi(1,n) = 137.91
Lat = 45	lon =105	A = .886212	B = .607058	Phi(1,n) = 132.917
Lat = 45	lon =115	A = .947785	B = .591415	Phi(1,n) = 132.879
Lat = 45	lon =125	A = .952949	B = .592968	Phi(1,n) = 126.006
Lat = 49	lon = 75	A = .989417	B = .753219	Phi(1,n) = 20.4364
Lat = 49	lon = 85	A = .969831	B = .763301	Phi(1,n) = 8.41726
Lat = 49	lon = 95	A = 1.78724	B = .620938	Phi(1,n) = 84.5925
Lat = 49	lon =105	A = 1.26311	B = .562831	Phi(1,n) = 34.2721
Lat = 49	lon =115	A = 1.08198	B = .575132	Phi(1,n) = 142.396
Lat = 49	lon =125	A = 1.02613	B = .585983	Phi(1,n) = 129.749

TABLE B7 STATIONS CDFG (STATION H IS OUT)

Lat = 25	lon = 75	A = .951341	B = .841114	Phi(1,n) = 70.6938
Lat = 25	lon = 85	A = .94043	B = .759071	Phi(1,n) = 87.0892
Lat = 25	lon = 95	A = .974805	B = .675884	Phi(1,n) = 178.295
Lat = 25	lon =105	A = .941694	B = .643786	Phi(1,n) = 187.331
Lat = 25	lon =115	A = .87318	B = .647526	Phi(1,n) = 90.5563
Lat = 25	lon =125	A = .901379	B = .630167	Phi(1,n) = 148.459
Lat = 30	lon = 75	A = .986664	B = .85568	Phi(1,n) = 56.5609
Lat = 30	lon = 85	A = .961627	B = .772	Phi(1,n) = 76.5154
Lat = 30	lon = 95	A = .964933	B = .683774	Phi(1,n) = 176.561
Lat = 30	lon =105	A = .880954	B = .660662	Phi(1,n) = 137.009
Lat = 30	lon =115	A = .867613	B = .645657	Phi(1,n) = 145.659
Lat = 30	lon =125	A = .977324	B = .608794	Phi(1,n) = 146.699
Lat = 35	lon = 75	A = 1.03558	B = .876014	Phi(1,n) = 37.569
Lat = 35	lon = 85	A = .990594	B = .797229	Phi(1,n) = 60.3582
Lat = 35	lon = 95	A = .960202	B = .694371	Phi(1,n) = 174.822
Lat = 35	lon =105	A = .845548	B = .668347	Phi(1,n) = 133.36
Lat = 35	lon =115	A = .945181	B = .61769	Phi(1,n) = 145.735
Lat = 35	lon =125	A = 1.08708	B = .591823	Phi(1,n) = 145.817
Lat = 40	lon = 75	A = 1.10723	B = .8984	Phi(1,n) = 102.594
Lat = 40	lon = 85	A = 1.04316	B = .842982	Phi(1,n) = 32.6091
Lat = 40	lon = 95	A = .97575	B = .713144	Phi(1,n) = 171.815
Lat = 40	lon =105	A = .872253	B = .645143	Phi(1,n) = 143.437
Lat = 40	lon =115	A = 1.09162	B = .591597	Phi(1,n) = 148.709
Lat = 40	lon =125	A = 1.25707	B = .580701	Phi(1,n) = 146.466
Lat = 45	lon = 75	A = 1.21727	B = .907155	Phi(1,n) = 72.7576
Lat = 45	lon = 85	A = 1.17147	B = .896037	Phi(1,n) = 76.2178
Lat = 45	lon = 95	A = 1.06246	B = .840152	Phi(1,n) = 17.3437
Lat = 45	lon =105	A = 1.22268	B = .580984	Phi(1,n) = 157.863
Lat = 45	lon =115	A = 1.42363	B = .575359	Phi(1,n) = 155.815
Lat = 45	lon =125	A = 1.52983	B = .578248	Phi(1,n) = 149.501
Lat = 49	lon = 75	A = 1.24671	B = .922753	Phi(1,n) = 59.771
Lat = 49	lon = 85	A = 1.24469	B = .934681	Phi(1,n) = 51.4152
Lat = 49	lon = 95	A = 3.09301	B = .773948	Phi(1,n) = 92.4126
Lat = 49	lon =105	A = 3.0526	B = .584967	Phi(1,n) = 13.8682
Lat = 49	lon =115	A = 1.98318	B = .578587	Phi(1,n) = 164.571
Lat = 49	lon =125	A = 1.80673	B = .585767	Phi(1,n) = 154.845

TABLE B8 STATIONS FGH (STATIONS C AND D ARE OUT)

Lat = 25	lon = 75	A = 1.72206	B = .810073	Phi(1,n) = 80.4923
Lat = 25	lon = 85	A = 1.64474	B = .820829	Phi(1,n) = 69.8865
Lat = 25	lon = 95	A = 1.62355	B = .823369	Phi(1,n) = 60.2439
Lat = 25	lon =105	A = 1.62688	B = .821555	Phi(1,n) = 52.0404
Lat = 25	lon =115	A = 1.6372	B = .818403	Phi(1,n) = 45.3052
Lat = 25	lon =125	A = 1.64441	B = .815705	Phi(1,n) = 39.8924
Lat = 30	lon = 75	A = 1.65104	B = .817105	Phi(1,n) = 79.3068
Lat = 30	lon = 85	A = 1.62075	B = .822603	Phi(1,n) = 68.9733
Lat = 30	lon = 95	A = 1.62168	B = .822588	Phi(1,n) = 59.7134
Lat = 30	lon =105	A = 1.63544	B = .81998	Phi(1,n) = 51.7333
Lat = 30	lon =115	A = 1.65093	B = .81684	Phi(1,n) = 44.9932
Lat = 30	lon =125	A = 1.66134	B = .814385	Phi(1,n) = 39.3672
Lat = 35	lon = 75	A = 1.60787	B = .821672	Phi(1,n) = 77.1789
Lat = 35	lon = 85	A = 1.6132	B = .822418	Phi(1,n) = 67.5009
Lat = 35	lon = 95	A = 1.63085	B = .820458	Phi(1,n) = 58.7755
Lat = 35	lon =105	A = 1.65244	B = .817405	Phi(1,n) = 51.0722
Lat = 35	lon =115	A = 1.67184	B = .814437	Phi(1,n) = 44.3488
Lat = 35	lon =125	A = 1.68491	B = .8123	Phi(1,n) = 38.5182
Lat = 40	lon = 75	A = 1.60595	B = .820827	Phi(1,n) = 74.3719
Lat = 40	lon = 85	A = 1.6299	B = .819065	Phi(1,n) = 65.6647
Lat = 40	lon = 95	A = 1.65616	B = .816397	Phi(1,n) = 57.5482
Lat = 40	lon =105	A = 1.68152	B = .813495	Phi(1,n) = 50.1285
Lat = 40	lon =115	A = 1.7028	B = .810969	Phi(1,n) = 43.4168
Lat = 40	lon =125	A = 1.71758	B = .809267	Phi(1,n) = 37.3751
Lat = 45	lon = 75	A = 1.65709	B = .813002	Phi(1,n) = 71.5884
Lat = 45	lon = 85	A = 1.67882	B = .811923	Phi(1,n) = 63.7865
Lat = 45	lon = 95	A = 1.70343	B = .810044	Phi(1,n) = 56.1947
Lat = 45	lon =105	A = 1.72726	B = .807988	Phi(1,n) = 48.9948
Lat = 45	lon =115	A = 1.74764	B = .806225	Phi(1,n) = 42.2547
Lat = 45	lon =125	A = 1.76277	B = .805098	Phi(1,n) = 35.9771
Lat = 49	lon = 75	A = 1.74135	B = .802605	Phi(1,n) = 69.8729
Lat = 49	lon = 85	A = 1.74622	B = .803718	Phi(1,n) = 62.4792
Lat = 49	lon = 95	A = 1.76147	B = .80332	Phi(1,n) = 55.1389
Lat = 49	lon =105	A = 1.77964	B = .802362	Phi(1,n) = 48.0208
Lat = 49	lon =115	A = 1.79687	B = .801411	Phi(1,n) = 41.2046
Lat = 49	lon =125	A = 1.81102	B = .800835	Phi(1,n) = 34.7079

TABLE B9 STATIONS DGH (STATIONS C AND F ARE OUT)

Lat = 25	lon = 75	A = 10.0345	B = .981939	Phi(1,n) = 105.831
Lat = 25	lon = 85	A = 19.6091	B = .975676	Phi(1,n) = 110.178
Lat = 25	lon = 95	A = 4.87499	B = .926929	Phi(1,n) = 124.487
Lat = 25	lon =105	A = 3.01455	B = .862035	Phi(1,n) = 138.678
Lat = 25	lon =115	A = 2.40216	B = .813485	Phi(1,n) = 148.972
Lat = 25	lon =125	A = 2.13822	B = .785414	Phi(1,n) = 154.854
Lat = 30	lon = 75	A = 7.19754	B = 1.0602	Phi(1,n) = 108.915
Lat = 30	lon = 85	A = 421.351	B = 1.03982	Phi(1,n) = 108.132
Lat = 30	lon = 95	A = 5.4661	B = .95686	Phi(1,n) = 124.684
Lat = 30	lon =105	A = 2.95216	B = .860752	Phi(1,n) = 142.141
Lat = 30	lon =115	A = 2.30632	B = .803252	Phi(1,n) = 153.613
Lat = 30	lon =125	A = 2.06584	B = .776214	Phi(1,n) = 159.07
Lat = 35	lon = 75	A = 5.93847	B = 1.16863	Phi(1,n) = 113.547
Lat = 35	lon = 85	A = 16.401	B = 1.14359	Phi(1,n) = 109.066
Lat = 35	lon = 95	A = 6.58492	B = 1.00312	Phi(1,n) = 123.95
Lat = 35	lon =105	A = 2.80253	B = .851177	Phi(1,n) = 147.578
Lat = 35	lon =115	A = 2.17729	B = .787688	Phi(1,n) = 160.15
Lat = 35	lon =125	A = 1.98649	B = .765406	Phi(1,n) = 164.4
Lat = 40	lon = 75	A = 6.23229	B = 1.28368	Phi(1,n) = 120.56
Lat = 40	lon = 85	A = 7.81268	B = 1.30641	Phi(1,n) = 112.061
Lat = 40	lon = 95	A = 10.8768	B = 1.09538	Phi(1,n) = 119.635
Lat = 40	lon =105	A = 2.48316	B = .820212	Phi(1,n) = 157.82
Lat = 40	lon =115	A = 1.62234	B = .79896	Phi(1,n) = 143.549
Lat = 40	lon =125	A = 1.56375	B = .784627	Phi(1,n) = 141.597
Lat = 45	lon = 75	A = 13.4724	B = 1.31933	Phi(1,n) = 126.565
Lat = 45	lon = 85	A = 10.3701	B = 1.38391	Phi(1,n) = 119.512
Lat = 45	lon = 95	A = 8.81121	B = 1.45497	Phi(1,n) = 109.661
Lat = 45	lon =105	A = 1.59211	B = .785797	Phi(1,n) = 153.376
Lat = 45	lon =115	A = 1.56366	B = .774077	Phi(1,n) = 150.769
Lat = 45	lon =125	A = 1.56696	B = .769756	Phi(1,n) = 146.493
Lat = 49	lon = 75	A = 23.4719	B = 1.26547	Phi(1,n) = 125.774
Lat = 49	lon = 85	A = 16.0195	B = 1.23629	Phi(1,n) = 116.794
Lat = 49	lon = 95	A = 3.8416	B = 1.01898	Phi(1,n) = 94.5163
Lat = 49	lon =105	A = 1.58674	B = .766095	Phi(1,n) = 25.6957
Lat = 49	lon =115	A = 1.58915	B = .761278	Phi(1,n) = 158.25
Lat = 49	lon =125	A = 1.60523	B = .760491	Phi(1,n) = 151.441

TABLE B10 STATIONS DFH (STATIONS C AND G ARE OUT)

Lat	lon	A	B	Phi(1,n)
25	75	7.28714	.721606	71.828
25	85	13.7984	.711316	72.3689
25	95	3.14648	.719141	83.9116
25	105	1.85475	.747975	99.5474
25	115	1.49657	.778049	117.014
25	125	1.41818	.789415	132.116
30	75	4.75297	.728411	70.8187
30	85	288.194	.712643	68.1235
30	95	3.42813	.717213	82.4215
30	105	1.78117	.752376	102.962
30	115	1.4502	.783922	124.855
30	125	1.42359	.787867	140.843
35	75	3.30892	.740318	69.5147
35	85	10.1853	.717785	66.0907
35	95	3.9828	.71469	79.6552
35	105	1.65832	.761328	109.472
35	115	1.41835	.788161	137.403
35	125	1.23988	.829211	56.4459
40	75	2.41249	.760567	68.3405
40	85	3.88158	.734008	63.0948
40	95	6.32024	.711197	72.9192
40	105	1.48029	.779668	125.617
40	115	1.4177	.78829	150.245
40	125	1.38661	.795449	150.361
45	75	1.87291	.79038	68.7283
45	85	2.0771	.77718	60.8418
45	95	3.62904	.736793	55.7591
45	105	1.39279	.794045	161.246
45	115	1.34754	.806354	160.505
45	125	1.32526	.811486	156.802
49	75	1.65014	.813497	71.796
49	85	1.63054	.817908	65.5076
49	95	1.36978	.863654	-39.3166
49	105	1.15786	.880149	184.222
49	115	1.24232	.840019	170.095
49	125	1.25737	.833952	162.521

TABLE B11 STATIONS DFG (STATIONS C AND H ARE OUT)

Lat = 25	lon = 75	A = 2.39658	B = .807976	Phi(1,n) = 84.559
Lat = 25	lon = 85	A = 1.99247	B = .772982	Phi(1,n) = 90.5713
Lat = 25	lon = 95	A = 1.68943	B = .752819	Phi(1,n) = 100.922
Lat = 25	lon =105	A = 1.51114	B = .753194	Phi(1,n) = 113.935
Lat = 25	lon =115	A = 1.43745	B = .767383	Phi(1,n) = 125.704
Lat = 25	lon =125	A = 1.41894	B = .784531	Phi(1,n) = 133.93
Lat = 30	lon = 75	A = 2.53896	B = .826765	Phi(1,n) = 80.8637
Lat = 30	lon = 85	A = 2.07622	B = .793241	Phi(1,n) = 87.2586
Lat = 30	lon = 95	A = 1.69992	B = .754519	Phi(1,n) = 100.325
Lat = 30	lon =105	A = 1.49297	B = .754095	Phi(1,n) = 117.408
Lat = 30	lon =115	A = 1.42708	B = .772532	Phi(1,n) = 131.284
Lat = 30	lon =125	A = 1.41901	B = .792452	Phi(1,n) = 139.52
Lat = 35	lon = 75	A = 2.89124	B = .849771	Phi(1,n) = 74.4614
Lat = 35	lon = 85	A = 2.27756	B = .799365	Phi(1,n) = 80.8649
Lat = 35	lon = 95	A = 1.72957	B = .757261	Phi(1,n) = 98.2848
Lat = 35	lon =105	A = 1.46667	B = .756465	Phi(1,n) = 123.23
Lat = 35	lon =115	A = 1.42023	B = .781981	Phi(1,n) = 139.656
Lat = 35	lon =125	A = 1.42594	B = .80411	Phi(1,n) = 147.04
Lat = 40	lon = 75	A = 3.90655	B = .876082	Phi(1,n) = 64.4438
Lat = 40	lon = 85	A = 2.88909	B = .827912	Phi(1,n) = 68.8362
Lat = 40	lon = 95	A = 1.83593	B = .764301	Phi(1,n) = 91.7812
Lat = 40	lon =105	A = 1.43291	B = .765034	Phi(1,n) = 135.404
Lat = 40	lon =115	A = 1.42867	B = .800501	Phi(1,n) = 152.525
Lat = 40	lon =125	A = 1.44591	B = .821311	Phi(1,n) = 156.957
Lat = 45	lon = 75	A = 9.56487	B = .903603	Phi(1,n) = 50.9938
Lat = 45	lon = 85	A = 6.70067	B = .880866	Phi(1,n) = 48.5876
Lat = 45	lon = 95	A = 3.2663	B = .821964	Phi(1,n) = 58.7093
Lat = 45	lon =105	A = 1.44774	B = .814539	Phi(1,n) = 167.805
Lat = 45	lon =115	A = 1.47175	B = .836695	Phi(1,n) = 171.219
Lat = 45	lon =125	A = 1.48444	B = .845769	Phi(1,n) = 169.333
Lat = 49	lon = 75	A = 17.0929	B = .927026	Phi(1,n) = 42.7159
Lat = 49	lon = 85	A = 12.0828	B = .942562	Phi(1,n) = 34.5892
Lat = 49	lon = 95	A = 3.96528	B = 1.03717	Phi(1,n) = 27.7709
Lat = 49	lon =105	A = 1.39038	B = .986631	Phi(1,n) = 199.89
Lat = 49	lon =115	A = 2.19705	B = .813988	Phi(1,n) = 65.6779
Lat = 49	lon =125	A = 2.1017	B = .810356	Phi(1,n) = 57.3323

TABLE B12 STATIONS CGH (STATIONS D AND F ARE OUT)

Lat	lon	A	B	Phi(1,n)
25	75	6.51573	1.16753	150.702
25	85	7.82365	1.25753	143.349
25	95	9.0685	1.3422	137.18
25	105	10.1655	1.41483	131.866
25	115	11.0325	1.46895	127.096
25	125	11.6165	1.49801	122.453
30	75	7.58611	1.18929	146.772
30	85	8.96079	1.26749	139.269
30	95	10.2788	1.33844	132.557
30	105	11.5047	1.39578	126.292
30	115	12.6517	1.4323	120.067
30	125	13.9238	1.43885	113.221
35	75	9.56308	1.22081	142.483
35	85	11.0601	1.28416	134.982
35	95	12.609	1.33956	127.857
35	105	14.294	1.38059	120.812
35	115	16.4296	1.39957	113.428
35	125	20.2867	1.38668	105.008
40	75	13.745	1.26319	138.039
40	85	15.3857	1.30807	130.631
40	95	17.5179	1.34626	123.208
40	105	20.5862	1.37078	115.566
40	115	26.2427	1.37403	107.344
40	125	44.0851	1.34743	97.9551
45	75	26.0041	1.31618	133.726
45	85	27.293	1.33935	126.392
45	95	31.4705	1.35919	118.742
45	105	41.3305	1.36776	110.663
45	115	77.4763	1.3579	101.888
45	125	217.393	1.32319	92.68
49	75	89.3608	1.36459	130.58
49	85	76.4174	1.36926	123.21
49	95	96.6915	1.37425	115.389
49	105	275.216	1.37092	107.046
49	115	130.709	1.3526	99.1342
49	125	39.4549	1.31447	91.3569

TABLE B13 STATIONS CFH (STATIONS D AND G ARE OUT)

Lat = 25	lon = 75	A = 2.07052	B = .780307	Phi(1,n) = 67.0991
Lat = 25	lon = 85	A = 2.23369	B = .772018	Phi(1,n) = 59.3628
Lat = 25	lon = 95	A = 2.39534	B = .764609	Phi(1,n) = 52.4866
Lat = 25	lon =105	A = 2.538	B = .758632	Phi(1,n) = 46.4527
Lat = 25	lon =115	A = 2.63989	B = .754446	Phi(1,n) = 41.1828
Lat = 25	lon =125	A = 2.67129	B = .752497	Phi(1,n) = 36.5637
Lat = 30	lon = 75	A = 1.99936	B = .78348	Phi(1,n) = 67.6489
Lat = 30	lon = 85	A = 2.11449	B = .777189	Phi(1,n) = 59.9603
Lat = 30	lon = 95	A = 2.21715	B = .771759	Phi(1,n) = 52.9576
Lat = 30	lon =105	A = 2.28939	B = .767878	Phi(1,n) = 46.6479
Lat = 30	lon =115	A = 2.30917	B = .766281	Phi(1,n) = 40.9821
Lat = 30	lon =125	A = 2.24892	B = .768217	Phi(1,n) = 35.8965
Lat = 35	lon = 75	A = 1.93759	B = .786771	Phi(1,n) = 68.1285
Lat = 35	lon = 85	A = 2.01563	B = .78239	Phi(1,n) = 60.4898
Lat = 35	lon = 95	A = 2.07605	B = .778945	Phi(1,n) = 53.3985
Lat = 35	lon =105	A = 2.10343	B = .77723	Phi(1,n) = 46.8899
Lat = 35	lon =115	A = 2.08058	B = .778261	Phi(1,n) = 40.9698
Lat = 35	lon =125	A = 1.99071	B = .783722	Phi(1,n) = 35.705
Lat = 40	lon = 75	A = 1.8836	B = .790149	Phi(1,n) = 68.5544
Lat = 40	lon = 85	A = 1.93334	B = .787538	Phi(1,n) = 60.9673
Lat = 40	lon = 95	A = 1.96119	B = .785963	Phi(1,n) = 53.8242
Lat = 40	lon =105	A = 1.96441	B = .786255	Phi(1,n) = 47.1924
Lat = 40	lon =115	A = 1.92296	B = .789491	Phi(1,n) = 41.1496
Lat = 40	lon =125	A = 1.83393	B = .797158	Phi(1,n) = 35.9171
Lat = 45	lon = 75	A = 1.83637	B = .793573	Phi(1,n) = 68.9374
Lat = 45	lon = 85	A = 1.86504	B = .792533	Phi(1,n) = 61.3998
Lat = 45	lon = 95	A = 1.87606	B = .792591	Phi(1,n) = 54.2333
Lat = 45	lon =105	A = 1.86151	B = .794514	Phi(1,n) = 47.5362
Lat = 45	lon =115	A = 1.81602	B = .799192	Phi(1,n) = 41.4505
Lat = 45	lon =125	A = 1.74162	B = .807409	Phi(1,n) = 36.2955
Lat = 49	lon = 75	A = 1.803	B = .796312	Phi(1,n) = 69.2172
Lat = 49	lon = 85	A = 1.81918	B = .796345	Phi(1,n) = 61.7119
Lat = 49	lon = 95	A = 1.81984	B = .79747	Phi(1,n) = 54.5356
Lat = 49	lon =105	A = 1.79982	B = .800326	Phi(1,n) = 47.8046
Lat = 49	lon =115	A = 1.75726	B = .805529	Phi(1,n) = 41.6904
Lat = 49	lon =125	A = 1.69801	B = .813215	Phi(1,n) = 36.5175

TABLE B14 STATIONS CFG (STATIONS D AND H ARE OUT)

Lat = 25	lon = 75	A = 5.25525	B = 1.0123	Phi(1,n) = 56.543
Lat = 25	lon = 85	A = 5.34913	B = .96121	Phi(1,n) = 51.2479
Lat = 25	lon = 95	A = 5.44384	B = .92392	Phi(1,n) = 46.1242
Lat = 25	lon =105	A = 5.52629	B = .897431	Phi(1,n) = 41.2926
Lat = 25	lon =115	A = 5.60757	B = .879717	Phi(1,n) = 36.7299
Lat = 25	lon =125	A = 5.73015	B = .869657	Phi(1,n) = 32.2585
Lat = 30	lon = 75	A = 5.93581	B = .989659	Phi(1,n) = 55.6923
Lat = 30	lon = 85	A = 6.20165	B = .949811	Phi(1,n) = 49.7525
Lat = 30	lon = 95	A = 6.46488	B = .920301	Phi(1,n) = 43.9625
Lat = 30	lon =105	A = 6.76355	B = .899432	Phi(1,n) = 38.3021
Lat = 30	lon =115	A = 7.18423	B = .886426	Phi(1,n) = 32.6058
Lat = 30	lon =125	A = 7.9614	B = .881684	Phi(1,n) = 26.4584
Lat = 35	lon = 75	A = 7.20898	B = .96375	Phi(1,n) = 54.2767
Lat = 35	lon = 85	A = 7.65814	B = .936247	Phi(1,n) = 47.8118
Lat = 35	lon = 95	A = 8.17404	B = .915227	Phi(1,n) = 41.4193
Lat = 35	lon =105	A = 8.88455	B = .900695	Phi(1,n) = 34.9776
Lat = 35	lon =115	A = 10.0901	B = .893235	Phi(1,n) = 28.2181
Lat = 35	lon =125	A = 12.797	B = .894811	Phi(1,n) = 20.5754
Lat = 40	lon = 75	A = 9.91701	B = .936644	Phi(1,n) = 52.2086
Lat = 40	lon = 85	A = 10.5402	B = .921391	Phi(1,n) = 45.3875
Lat = 40	lon = 95	A = 11.5287	B = .908976	Phi(1,n) = 38.4846
Lat = 40	lon =105	A = 13.2593	B = .90106	Phi(1,n) = 31.3426
Lat = 40	lon =115	A = 16.9674	B = .899433	Phi(1,n) = 23.6471
Lat = 40	lon =125	A = 29.5703	B = .907211	Phi(1,n) = 14.7965
Lat = 45	lon = 75	A = 17.8256	B = .910916	Phi(1,n) = 49.4939
Lat = 45	lon = 85	A = 18.2912	B = .906364	Phi(1,n) = 42.4767
Lat = 45	lon = 95	A = 20.7189	B = .901939	Phi(1,n) = 35.1659
Lat = 45	lon =105	A = 27.0784	B = .900377	Phi(1,n) = 27.4291
Lat = 45	lon =115	A = 51.523	B = .904249	Phi(1,n) = 18.9662
Lat = 45	lon =125	A = 150.776	B = .917132	Phi(1,n) = 9.94222
Lat = 49	lon = 75	A = 58.419	B = .892897	Phi(1,n) = 46.9299
Lat = 49	lon = 85	A = 49.8808	B = .895008	Phi(1,n) = 39.8251
Lat = 49	lon = 95	A = 62.993	B = .896054	Phi(1,n) = 32.2534
Lat = 49	lon =105	A = 180.491	B = .899008	Phi(1,n) = 24.1246
Lat = 49	lon =115	A = 87.5462	B = .906646	Phi(1,n) = 16.3887
Lat = 49	lon =125	A = 27.5776	B = .922418	Phi(1,n) = 9.03431

TABLE B15 STATIONS CDH (STATIONS F AND G ARE OUT)

Lat = 25	lon = 75	A = 20.0307	B = 1.83359	Phi(1,n) = 130.782
Lat = 25	lon = 85	A = 35.565	B = 1.6762	Phi(1,n) = 131.772
Lat = 25	lon = 95	A = 9.02485	B = 1.35339	Phi(1,n) = 143.211
Lat = 25	lon =105	A = 5.50757	B = 1.08687	Phi(1,n) = 153.178
Lat = 25	lon =115	A = 4.31893	B = .937334	Phi(1,n) = 159.949
Lat = 25	lon =125	A = 3.77016	B = .860182	Phi(1,n) = 163.554
Lat = 30	lon = 75	A = 14.4665	B = 1.81652	Phi(1,n) = 131.013
Lat = 30	lon = 85	A = 687.457	B = 1.69031	Phi(1,n) = 126.249
Lat = 30	lon = 95	A = 9.01533	B = 1.32399	Phi(1,n) = 140.478
Lat = 30	lon =105	A = 4.70588	B = 1.02403	Phi(1,n) = 153.692
Lat = 30	lon =115	A = 3.52268	B = .880453	Phi(1,n) = 161.619
Lat = 30	lon =125	A = 2.98568	B = .815839	Phi(1,n) = 164.752
Lat = 35	lon = 75	A = 12.6134	B = 1.76705	Phi(1,n) = 131.979
Lat = 35	lon = 85	A = 25.4143	B = 1.73159	Phi(1,n) = 123.69
Lat = 35	lon = 95	A = 9.68157	B = 1.3126	Phi(1,n) = 136.491
Lat = 35	lon =105	A = 3.92721	B = .953614	Phi(1,n) = 155.844
Lat = 35	lon =115	A = 2.8837	B = .826293	Phi(1,n) = 165.138
Lat = 35	lon =125	A = 2.45183	B = .780697	Phi(1,n) = 167.377
Lat = 40	lon = 75	A = 15.5595	B = 1.64625	Phi(1,n) = 132.741
Lat = 40	lon = 85	A = 12.5609	B = 1.75936	Phi(1,n) = 123.737
Lat = 40	lon = 95	A = 14.2175	B = 1.35927	Phi(1,n) = 128.632
Lat = 40	lon =105	A = 3.07353	B = .865342	Phi(1,n) = 162.491
Lat = 40	lon =115	A = 1.96346	B = .797808	Phi(1,n) = 149.737
Lat = 40	lon =125	A = 1.74016	B = .778697	Phi(1,n) = 145.717
Lat = 45	lon = 75	A = 115.598	B = 1.45269	Phi(1,n) = 130.713
Lat = 45	lon = 85	A = 26.6621.	B = 1.54676	Phi(1,n) = 124.528
Lat = 45	lon = 95	A = 11.479	B = 1.69194	Phi(1,n) = 115.527
Lat = 45	lon =105	A = 1.79212	B = .780526	Phi(1,n) = 157.75
Lat = 45	lon =115	A = 1.66209	B = .769065	Phi(1,n) = 153.435
Lat = 45	lon =125	A = 1.53554	B = .771884	Phi(1,n) = 145.505
Lat = 49	lon = 75	A = 16.2885	B = 1.29083	Phi(1,n) = 126.223
Lat = 49	lon = 85	A = 11.9379	B = 1.26275	Phi(1,n) = 117.139
Lat = 49	lon = 95	A = 3.72804	B = 1.02426	Phi(1,n) = 93.9142
Lat = 49	lon =105	A = 1.61155	B = .763794	Phi(1,n) = 25.7356
Lat = 49	lon =115	A = 1.53609	B = .765682	Phi(1,n) = 156.25
Lat = 49	lon =125	A = 1.44333	B = .775093	Phi(1,n) = 145.004

TABLE B16 STATIONS CDG (STATIONS F AND H ARE OUT)

Lat = 25	lon = 75	A = 8.36899	B = 1.34897	Phi(1,n) = 145.535
Lat = 25	lon = 85	A = 6.99157	B = 1.16763	Phi(1,n) = 146.18
Lat = 25	lon = 95	A = 5.91036	B = .986779	Phi(1,n) = 150.423
Lat = 25	lon =105	A = 5.25021	B = .85943	Phi(1,n) = 156.45
Lat = 25	lon =115	A = 4.95721	B = .790424	Phi(1,n) = 161.399
Lat = 25	lon =125	A = 4.89155	B = .756273	Phi(1,n) = 163.893
Lat = 30	lon = 75	A = 11.3785	B = 1.53783	Phi(1,n) = 138.466
Lat = 30	lon = 85	A = 8.91265	B = 1.26253	Phi(1,n) = 139.41
Lat = 30	lon = 95	A = 7.11245	B = .998706	Phi(1,n) = 145.194
Lat = 30	lon =105	A = 6.21678	B = .833956	Phi(1,n) = 153.337
Lat = 30	lon =115	A = 6.09253	B = .761802	Phi(1,n) = 158.724
Lat = 30	lon =125	A = 6.5281	B = .731998	Phi(1,n) = 159.776
Lat = 35	lon = 75	A = 18.3859	B = 1.91747	Phi(1,n) = 129.853
Lat = 35	lon = 85	A = 12.9937	B = 1.4591	Phi(1,n) = 130.81
Lat = 35	lon = 95	A = 9.29349	B = 1.02833	Phi(1,n) = 139.1
Lat = 35	lon =105	A = 7.84921	B = .801534	Phi(1,n) = 151.696
Lat = 35	lon =115	A = 8.22883	B = .73458	Phi(1,n) = 157.84
Lat = 35	lon =125	A = 10.1656	B = .714932	Phi(1,n) = 157.215
Lat = 40	lon = 75	A = 43.0951	B = 2.91197	Phi(1,n) = 119.449
Lat = 40	lon = 85	A = 25.5739	B = 2.009	Phi(1,n) = 119.073
Lat = 40	lon = 95	A = 14.3934	B = 1.12223	Phi(1,n) = 130.447
Lat = 40	lon =105	A = 11.0658	B = .755429	Phi(1,n) = 153.959
Lat = 40	lon =115	A = 13.4073	B = .713152	Phi(1,n) = 159.794
Lat = 40	lon =125	A = 23.0425	B = .707795	Phi(1,n) = 156.581
Lat = 45	lon = 75	A = 678.556	B = 8.50256	Phi(1,n) = 107.396
Lat = 45	lon = 85	A = 159.815	B = 5.55582	Phi(1,n) = 102.884
Lat = 45	lon = 95	A = 54.2731	B = 2.28314	Phi(1,n) = 105.632
Lat = 45	lon =105	A = 21.2637	B = .708	Phi(1,n) = 168.332
Lat = 45	lon =115	A = 40.4416	B = .709961	Phi(1,n) = 165.389
Lat = 45	lon =125	A = 117.364	B = .714503	Phi(1,n) = 158.621
Lat = 49	lon = 75	A = 628.413	B = 8.90003	Phi(1,n) = 94.5255
Lat = 49	lon = 85	A = 378.928	B = 6.44243	Phi(1,n) = 85.512
Lat = 49	lon = 95	A = 135.931	B = 1.92871	Phi(1,n) = 62.8303
Lat = 49	lon =105	A = 153.075	B = .763325	Phi(1,n) = 8.11425
Lat = 49	lon =115	A = 70.7259	B = .732484	Phi(1,n) = 172.744
Lat = 49	lon =125	A = 21.8694	B = .732535	Phi(1,n) = 163.968

TABLE B17 STATIONS CDF (STATIONS G AND H ARE POUT)

Lat = 25	lon = 75	A = 1.28425	B = .933038	Phi(1,n) = 73.8131
Lat = 25	lon = 85	A = 1.30919	B = .859935	Phi(1,n) = 83.0571
Lat = 25	lon = 95	A = 1.37402	B = .796194	Phi(1,n) = 185.995
Lat = 25	lon =105	A = 1.49166	B = .752439	Phi(1,n) = 200.126
Lat = 25	lon =115	A = .986048	B = .906377	Phi(1,n) = 85.6576
Lat = 25	lon =125	A = 1.04882	B = .86887	Phi(1,n) = 127.895
Lat = 30	lon = 75	A = 1.28062	B = .963077	Phi(1,n) = 68.3291
Lat = 30	lon = 85	A = 1.30777	B = .877936	Phi(1,n) = 77.635
Lat = 30	lon = 95	A = 1.37949	B = .797943	Phi(1,n) = 182.873
Lat = 30	lon =105	A = 1.05198	B = .868174	Phi(1,n) = 129.742
Lat = 30	lon =115	A = .988416	B = .904525	Phi(1,n) = 130.934
Lat = 30	lon =125	A = 1.11591	B = .843326	Phi(1,n) = 139.363
Lat = 35	lon = 75	A = 1.27386	B = 1.01035	Phi(1,n) = 61.0291
Lat = 35	lon = 85	A = 1.30165	B = .911567	Phi(1,n) = 69.6725
Lat = 35	lon = 95	A = 1.38001	B = .803727	Phi(1,n) = 178.515
Lat = 35	lon =105	A = .992911	B = .901676	Phi(1,n) = 116.911
Lat = 35	lon =115	A = 1.0772	B = .85857	Phi(1,n) = 143.626
Lat = 35	lon =125	A = 1.24206	B = .817918	Phi(1,n) = 144.45
Lat = 40	lon = 75	A = 1.26173	B = 1.08834	Phi(1,n) = 51.3264
Lat = 40	lon = 85	A = 1.28684	B = .983631	Phi(1,n) = 57.0206
Lat = 40	lon = 95	A = 1.36852	B = .823658	Phi(1,n) = 170.262
Lat = 40	lon =105	A = 1.00896	B = .8915	Phi(1,n) = 155.374
Lat = 40	lon =115	A = 1.25252	B = .818257	Phi(1,n) = 149.431
Lat = 40	lon =125	A = 1.4506	B = .804147	Phi(1,n) = 148.034
Lat = 45	lon = 75	A = 1.24092	B = 1.21907	Phi(1,n) = 39.0189
Lat = 45	lon = 85	A = 1.25291	B = 1.15657	Phi(1,n) = 37.0767
Lat = 45	lon = 95	A = 1.30384	B = .990459	Phi(1,n) = 47.2835
Lat = 45	lon =105	A = 1.40973	B = .804921	Phi(1,n) = 159.317
Lat = 45	lon =115	A = 1.64829	B = .800054	Phi(1,n) = 157.514
Lat = 45	lon =125	A = 1.81245	B = .807936	Phi(1,n) = 152.236
Lat = 49	lon = 75	A = 1.37833	B = 1.21681	Phi(1,n) = 27.9319
Lat = 49	lon = 85	A = 1.43385	B = 1.20514	Phi(1,n) = 17.8078
Lat = 49	lon = 95	A = 3.67849	B = 1.0173	Phi(1,n) = 94.4863
Lat = 49	lon =105	A = 3.47214	B = .822478	Phi(1,n) = 13.1345
Lat = 49	lon =115	A = 2.37517	B = .814186	Phi(1,n) = 166.036
Lat = 49	lon =125	A = 2.31788	B = .826496	Phi(1,n) = 156.421

TABLE B18 OMEGA OPERATION IN RHO/RHO MODE IN CONUS USING C AN D D

Lat = 25	lon = 75	A = 2.19511	B = .74692	Phi(1,n) = 215.749
Lat = 25	lon = 85	A = 1.58378	B = .79024	Phi(1,n) = 220.082
Lat = 25	lon = 95	A = 1.18451	B = .881381	Phi(1,n) = 226.991
Lat = 25	lon =105	A = 1.04994	B = .956572	Phi(1,n) = 144.813
Lat = 25	lon =115	A = 1.3015	B = .842258	Phi(1,n) = 150.907
Lat = 25	lon =125	A = 1.62366	B = .785511	Phi(1,n) = 154.2
Lat = 30	lon = 75	A = 2.51906	B = .736727	Phi(1,n) = 211.905
Lat = 30	lon = 85	A = 1.6851	B = .779011	Phi(1,n) = 216.167
Lat = 30	lon = 95	A = 1.16602	B = .889288	Phi(1,n) = 224.455
Lat = 30	lon =105	A = 1.13937	B = .901785	Phi(1,n) = 144.326
Lat = 30	lon =115	A = 1.56854	B = .792168	Phi(1,n) = 150.914
Lat = 30	lon =125	A = 2.23074	B = .745554	Phi(1,n) = 153.058
Lat = 35	lon = 75	A = 3.21602	B = .724844	Phi(1,n) = 206.818
Lat = 35	lon = 85	A = 1.93018	B = .759938	Phi(1,n) = 210.517
Lat = 35	lon = 95	A = 1.16837	B = .888248	Phi(1,n) = 221.051
Lat = 35	lon =105	A = 1.29959	B = .842776	Phi(1,n) = 145.209
Lat = 35	lon =115	A = 2.15361	B = .748609	Phi(1,n) = 152.503
Lat = 35	lon =125	A = 3.93729	B = .718794	Phi(1,n) = 153.129
Lat = 40	lon = 75	A = 5.35191	B = .713361	Phi(1,n) = 200.098
Lat = 40	lon = 85	A = 2.71321	B = .732417	Phi(1,n) = 201.706
Lat = 40	lon = 95	A = 1.24594	B = .858813	Phi(1,n) = 215.015
Lat = 40	lon =105	A = 1.74949	B = .773065	Phi(1,n) = 149.854
Lat = 40	lon =115	A = 4.44255	B = .716238	Phi(1,n) = 156.714
Lat = 40	lon =125	A = 30.8284	B = .707293	Phi(1,n) = 154.823
Lat = 45	lon = 75	A = 48.7033	B = .707181	Phi(1,n) = 191.613
Lat = 45	lon = 85	A = 10.381	B = .708753	Phi(1,n) = 188.004
Lat = 45	lon = 95	A = 2.6612	B = .733473	Phi(1,n) = 192.469
Lat = 45	lon =105	A = 13.9069	B = .708023	Phi(1,n) = 166.423
Lat = 45	lon =115	A = 10.3053	B = .708777	Phi(1,n) = 164.386
Lat = 45	lon =125	A = 4.73654	B = .715121	Phi(1,n) = 158.272
Lat = 49	lon = 75	A = 7.58503	B = .7102	Phi(1,n) = 183.979
Lat = 49	lon = 85	A = 5.60502	B = .712802	Phi(1,n) = 174.814
Lat = 49	lon = 95	A = 1.86249	B = .764335	Phi(1,n) = 152.074
Lat = 49	lon =105	A = 1.90089	B = .761773	Phi(1,n) = 187.83
Lat = 49	lon =115	A = 2.61351	B = .734501	Phi(1,n) = 172.147
Lat = 49	lon =125	A = 2.44242	B = .738744	Phi(1,n) = 162.015

TABLE B19 OMEGA OPERATION IN RHO/RHO MODE IN CONUS FOR C AND F

Lat = 25	lon = 75	A = 1.31017	B = .83994	Phi(1,n) = 229.621
Lat = 25	lon = 85	A = 1.39044	B = .82123	Phi(1,n) = 224.132
Lat = 25	lon = 95	A = 1.47506	B = .805719	Phi(1,n) = 218.984
Lat = 25	lon =105	A = 1.55555	B = .793868	Phi(1,n) = 214.186
Lat = 25	lon =115	A = 1.62059	B = .785859	Phi(1,n) = 209.686
Lat = 25	lon =125	A = 1.65406	B = .782183	Phi(1,n) = 205.326
Lat = 30	lon = 75	A = 1.28266	B = .847526	Phi(1,n) = 229.058
Lat = 30	lon = 85	A = 1.33906	B = .832668	Phi(1,n) = 223.231
Lat = 30	lon = 95	A = 1.39338	B = .820628	Phi(1,n) = 217.619
Lat = 30	lon =105	A = 1.43625	B = .812383	Phi(1,n) = 212.181
Lat = 30	lon =115	A = 1.45519	B = .809043	Phi(1,n) = 206.782
Lat = 30	lon =125	A = 1.43295	B = .812985	Phi(1,n) = 201.107
Lat = 35	lon = 75	A = 1.25545	B = .855749	Phi(1,n) = 228.396
Lat = 35	lon = 85	A = 1.29206	B = .844856	Phi(1,n) = 222.207
Lat = 35	lon = 95	A = 1.32277	B = .836687	Phi(1,n) = 216.122
Lat = 35	lon =105	A = 1.33881	B = .832728	Phi(1,n) = 210.053
Lat = 35	lon =115	A = 1.32922	B = .835072	Phi(1,n) = 203.81
Lat = 35	lon =125	A = 1.28068	B = .8481	Phi(1,n) = 196.988
Lat = 40	lon = 75	A = 1.22865	B = .864654	Phi(1,n) = 227.642
Lat = 40	lon = 85	A = 1.24911	B = .857782	Phi(1,n) = 221.078
Lat = 40	lon = 95	A = 1.26181	B = .853759	Phi(1,n) = 214.52
Lat = 40	lon =105	A = 1.25934	B = .854527	Phi(1,n) = 207.852
Lat = 40	lon =115	A = 1.23331	B = .863044	Phi(1,n) = 200.856
Lat = 40	lon =125	A = 1.17532	B = .885239	Phi(1,n) = 193.124
Lat = 45	lon = 75	A = 1.2024	B = .874263	Phi(1,n) = 226.802
Lat = 45	lon = 85	A = 1.21001	B = .871382	Phi(1,n) = 219.857
Lat = 45	lon = 95	A = 1.20941	B = .871606	Phi(1,n) = 212.84
Lat = 45	lon =105	A = 1.19484	B = .877211	Phi(1,n) = 205.622
Lat = 45	lon =115	A = 1.16058	B = .891726	Phi(1,n) = 197.989
Lat = 45	lon =125	A = 1.10228	B = .921761	Phi(1,n) = 189.59
Lat = 49	lon = 75	A = 1.19192	B = .882456	Phi(1,n) = 226.075
Lat = 49	lon = 85	A = 1.18142	B = .882664	Phi(1,n) = 218.825
Lat = 49	lon = 95	A = 1.17306	B = .886208	Phi(1,n) = 211.456
Lat = 49	lon =105	A = 1.15241	B = .895499	Phi(1,n) = 203.841
Lat = 49	lon =115	A = 1.11556	B = .914227	Phi(1,n) = 195.785
Lat = 49	lon =125	A = 1.06013	B = .948845	Phi(1,n) = 187.008

TABLE B20 OMEGA OPERATION IN RHO/RHO MODE IN CONUS FOR C AND G

Lat = 25	lon = 75	A = 1.74417	B = .773526	Phi(1,n) = 173.041
Lat = 25	lon = 85	A = 1.91932	B = .760607	Phi(1,n) = 171.947
Lat = 25	lon = 95	A = 2.05863	B = .752915	Phi(1,n) = 170.25
Lat = 25	lon =105	A = 2.1664	B = .748077	Phi(1,n) = 168.099
Lat = 25	lon =115	A = 2.25095	B = .744811	Phi(1,n) = 165.507
Lat = 25	lon =125	A = 2.33092	B = .742076	Phi(1,n) = 162.358
Lat = 30	lon = 75	A = 2.05995	B = .752851	Phi(1,n) = 175.527
Lat = 30	lon = 85	A = 2.27399	B = .74399	Phi(1,n) = 173.239
Lat = 30	lon = 95	A = 2.4644	B = .738144	Phi(1,n) = 170.449
Lat = 30	lon =105	A = 2.6485	B = .733741	Phi(1,n) = 167.202
Lat = 30	lon =115	A = 2.86025	B = .729759	Phi(1,n) = 163.396
Lat = 30	lon =125	A = 3.18902	B = .725158	Phi(1,n) = 158.728
Lat = 35	lon = 75	A = 2.60912	B = .734599	Phi(1,n) = 178.392
Lat = 35	lon = 85	A = 2.86972	B = .729602	Phi(1,n) = 174.763
Lat = 35	lon = 95	A = 3.14398	B = .725699	Phi(1,n) = 170.81
Lat = 35	lon =105	A = 3.47908	B = .72218	Phi(1,n) = 166.445
Lat = 35	lon =115	A = 3.98811	B = .71849	Phi(1,n) = 161.458
Lat = 35	lon =125	A = 5.05139	B = .714138	Phi(1,n) = 155.428
Lat = 40	lon = 75	A = 3.72619	B = .720193	Phi(1,n) = 181.567
Lat = 40	lon = 85	A = 4.03227	B = .718237	Phi(1,n) = 176.5
Lat = 40	lon = 95	A = 4.47578	B = .7161	Phi(1,n) = 171.347
Lat = 40	lon =105	A = 5.19673	B = .713745	Phi(1,n) = 165.873
Lat = 40	lon =115	A = 6.66517	B = .71112	Phi(1,n) = 159.783
Lat = 40	lon =125	A = 11.5209	B = .708442	Phi(1,n) = 152.618
Lat = 45	lon = 75	A = 6.91286	B = .710835	Phi(1,n) = 184.91
Lat = 45	lon = 85	A = 7.13004	B = .71061	Phi(1,n) = 178.406
Lat = 45	lon = 95	A = 8.11764	B = .709805	Phi(1,n) = 172.062
Lat = 45	lon =105	A = 10.6302	B = .708676	Phi(1,n) = 165.523
Lat = 45	lon =115	A = 20.1446	B = .707543	Phi(1,n) = 158.44
Lat = 45	lon =125	A = 58.0891	B = .707159	Phi(1,n) = 150.384
Lat = 49	lon = 75	A = 23.1294	B = .707437	Phi(1,n) = 187.577
Lat = 49	lon = 85	A = 19.7028	B = .707563	Phi(1,n) = 180.004
Lat = 49	lon = 95	A = 21.8544	B = .707393	Phi(1,n) = 172.756
Lat = 49	lon =105	A = 70.9377	B = .707142	Phi(1,n) = 165.42
Lat = 49	lon =115	A = 34.1393	B = .707259	Phi(1,n) = 157.637
Lat = 49	lon =125	A = 10.5654	B = .708696	Phi(1,n) = 149.024

TABLE B21 OMEGA OPERATION IN RHO/RHO MODE IN CONUS USING C AND H

Lat = 25	lon = 75	A = 1.65222	B = .782378	Phi(1,n) = 222.296
Lat = 25	lon = 85	A = 1.80305	B = .768685	Phi(1,n) = 216.655
Lat = 25	lon = 95	A = 1.95215	B = .758623	Phi(1,n) = 211.575
Lat = 25	lon =105	A = 2.08384	B = .751707	Phi(1,n) = 206.985
Lat = 25	lon =115	A = 2.17878	B = .747572	Phi(1,n) = 202.754
Lat = 25	lon =125	A = 2.21062	B = .746317	Phi(1,n) = 198.672
Lat = 30	lon = 75	A = 1.58863	B = .789641	Phi(1,n) = 222.033
Lat = 30	lon = 85	A = 1.69561	B = .777984	Phi(1,n) = 216.003
Lat = 30	lon = 95	A = 1.79131	B = .769603	Phi(1,n) = 210.373
Lat = 30	lon =105	A = 1.85951	B = .764541	Phi(1,n) = 205.037
Lat = 30	lon =115	A = 1.88006	B = .76314	Phi(1,n) = 199.802
Lat = 30	lon =125	A = 1.82741	B = .766842	Phi(1,n) = 194.303
Lat = 35	lon = 75	A = 1.53193	B = .797101	Phi(1,n) = 221.606
Lat = 35	lon = 85	A = 1.60437	B = .787743	Phi(1,n) = 215.178
Lat = 35	lon = 95	A = 1.66094	B = .781462	Phi(1,n) = 209.004
Lat = 35	lon =105	A = 1.68718	B = .778806	Phi(1,n) = 202.95
Lat = 35	lon =115	A = 1.66662	B = .780874	Phi(1,n) = 196.776
Lat = 35	lon =125	A = 1.58142	B = .790534	Phi(1,n) = 190.035
Lat = 40	lon = 75	A = 1.48077	B = .804795	Phi(1,n) = 221.03
Lat = 40	lon = 85	A = 1.52616	B = .79792	Phi(1,n) = 214.202
Lat = 40	lon = 95	A = 1.55422	B = .794045	Phi(1,n) = 207.499
Lat = 40	lon =105	A = 1.55337	B = .794159	Phi(1,n) = 200.772
Lat = 40	lon =115	A = 1.51174	B = .800018	Phi(1,n) = 193.761
Lat = 40	lon =125	A = 1.41922	B = .81554	Phi(1,n) = 186.02
Lat = 45	lon = 75	A = 1.43433	B = .812733	Phi(1,n) = 220.319
Lat = 45	lon = 85	A = 1.45879	B = .808429	Phi(1,n) = 213.092
Lat = 45	lon = 95	A = 1.46656	B = .80712	Phi(1,n) = 205.886
Lat = 45	lon =105	A = 1.44902	B = .810114	Phi(1,n) = 198.546
Lat = 45	lon =115	A = 1.39851	B = .819587	Phi(1,n) = 190.824
Lat = 45	lon =125	A = 1.3106	B = .839826	Phi(1,n) = 182.338
Lat = 49	lon = 75	A = 1.4002	B = .819248	Phi(1,n) = 219.66
Lat = 49	lon = 85	A = 1.41167	B = .816988	Phi(1,n) = 212.121
Lat = 49	lon = 95	A = 1.40788	B = .817726	Phi(1,n) = 204.535
Lat = 49	lon =105	A = 1.3824	B = .822908	Phi(1,n) = 196.756
Lat = 49	lon =115	A = 1.33025	B = .834816	Phi(1,n) = 188.561
Lat = 49	lon =125	A = 1.24991	B = .857521	Phi(1,n) = 179.639

TABLE B22 OMEGA OPERATION IN RHO/RHO MODE IN CONUS FOR D AND F

Lat = 25	lon = 75	A = 2.94931	B = .72835	Phi(1,n) = 248.413
Lat = 25	lon = 85	A = 10.0122	B = .708877	Phi(1,n) = 250.649
Lat = 25	lon = 95	A = 5.07585	B = .71407	Phi(1,n) = 255.636
Lat = 25	lon =105	A = 2.00723	B = .755541	Phi(1,n) = 81.8504
Lat = 25	lon =115	A = 1.36415	B = .826861	Phi(1,n) = 86.7771
Lat = 25	lon =125	A = 1.12667	B = .90826	Phi(1,n) = 89.5088
Lat = 30	lon = 75	A = 2.39761	B = .740022	Phi(1,n) = 245.36
Lat = 30	lon = 85	A = 5.75006	B = .712515	Phi(1,n) = 248.041
Lat = 30	lon = 95	A = 5.94085	B = .712169	Phi(1,n) = 254.951
Lat = 30	lon =105	A = 1.87581	B = .763426	Phi(1,n) = 83.8201
Lat = 30	lon =115	A = 1.26021	B = .854254	Phi(1,n) = 89.9866
Lat = 30	lon =125	A = 1.05776	B = .950774	Phi(1,n) = 92.6267
Lat = 35	lon = 75	A = 1.92271	B = .760397	Phi(1,n) = 241.097
Lat = 35	lon = 85	A = 3.48994	B = .722084	Phi(1,n) = 243.697
Lat = 35	lon = 95	A = 8.22935	B = .709732	Phi(1,n) = 253.365
Lat = 35	lon =105	A = 1.66347	B = .781199	Phi(1,n) = 87.0904
Lat = 35	lon =115	A = 1.1311	B = .905962	Phi(1,n) = 94.6418
Lat = 35	lon =125	A = 1.02051	B = .980678	Phi(1,n) = 186.642
Lat = 40	lon = 75	A = 1.52914	B = .797494	Phi(1,n) = 235.234
Lat = 40	lon = 85	A = 2.13183	B = .749539	Phi(1,n) = 236.184
Lat = 40	lon = 95	A = 81.8382	B = .707133	Phi(1,n) = 249.098
Lat = 40	lon =105	A = 1.33431	B = .833818	Phi(1,n) = 94.0128
Lat = 40	lon =115	A = 1.01532	B = .985356	Phi(1,n) = 191.698
Lat = 40	lon =125	A = 1.14087	B = .901043	Phi(1,n) = 191.81
Lat = 45	lon = 75	A = 1.22703	B = .86522	Phi(1,n) = 227.634
Lat = 45	lon = 85	A = 1.33985	B = .832479	Phi(1,n) = 223.763
Lat = 45	lon = 95	A = 2.03137	B = .75428	Phi(1,n) = 228.249
Lat = 45	lon =105	A = 1.11881	B = .912452	Phi(1,n) = 202.708
Lat = 45	lon =115	A = 1.2777	B = .848969	Phi(1,n) = 201.923
Lat = 45	lon =125	A = 1.36038	B = .827706	Phi(1,n) = 198.176
Lat = 49	lon = 75	A = 1.05481	B = .952933	Phi(1,n) = 220.726
Lat = 49	lon = 85	A = 1.0177	B = .983189	Phi(1,n) = 211.578
Lat = 49	lon = 95	A = 1.38837	B = .821659	Phi(1,n) = 99.1439
Lat = 49	lon =105	A = 2.56357	B = .735645	Phi(1,n) = 45.6795
Lat = 49	lon =115	A = 1.76355	B = .771869	Phi(1,n) = 31.4829
Lat = 49	lon =125	A = 1.67362	B = .780159	Phi(1,n) = 203.837

TABLE B23 OMEGA OPERATION IN RHO/RHO MODE IN CONUS FOR D AND G

Lat = 25	lon = 75	A = 1.04252	B = .962294	Phi(1,n) = 191.832
Lat = 25	lon = 85	A = 1.05953	B = .949492	Phi(1,n) = 288.464
Lat = 25	lon = 95	A = 1.28937	B = .845612	Phi(1,n) = 296.902
Lat = 25	lon =105	A = 1.78871	B = .769812	Phi(1,n) = 125.763
Lat = 25	lon =115	A = 2.80521	B = .730702	Phi(1,n) = 132.599
Lat = 25	lon =125	A = 4.98316	B = .714335	Phi(1,n) = 136.541
Lat = 30	lon = 75	A = 1.1922	B = .878261	Phi(1,n) = 191.83
Lat = 30	lon = 85	A = 1.03822	B = .965709	Phi(1,n) = 198.05
Lat = 30	lon = 95	A = 1.20317	B = .873967	Phi(1,n) = 297.781
Lat = 30	lon =105	A = 1.81899	B = .767469	Phi(1,n) = 128.842
Lat = 30	lon =115	A = 3.27155	B = .724225	Phi(1,n) = 136.601
Lat = 30	lon =125	A = 7.15732	B = .710583	Phi(1,n) = 140.247
Lat = 35	lon = 75	A = 1.48545	B = .804049	Phi(1,n) = 191.093
Lat = 35	lon = 85	A = 1.21014	B = .871332	Phi(1,n) = 196.253
Lat = 35	lon = 95	A = 1.10562	B = .919822	Phi(1,n) = 298.053
Lat = 35	lon =105	A = 1.95217	B = .758621	Phi(1,n) = 133.482
Lat = 35	lon =115	A = 4.51264	B = .715832	Phi(1,n) = 142.29
Lat = 35	lon =125	A = 17.6261	B = .707676	Phi(1,n) = 145.082
Lat = 40	lon = 75	A = 2.22483	B = .745776	Phi(1,n) = 189.159
Lat = 40	lon = 85	A = 1.66034	B = .781524	Phi(1,n) = 191.607
Lat = 40	lon = 95	A = 1.02408	B = .977541	Phi(1,n) = 205.925
Lat = 40	lon =105	A = 2.56234	B = .735674	Phi(1,n) = 142.034
Lat = 40	lon =115	A = 13.2093	B = .708122	Phi(1,n) = 150.624
Lat = 40	lon =125	A = 18.3827	B = .707631	Phi(1,n) = 151.304
Lat = 45	lon = 75	A = 6.05808	B = .711973	Phi(1,n) = 185.742
Lat = 45	lon = 85	A = 4.24123	B = .717144	Phi(1,n) = 182.312
Lat = 45	lon = 95	A = 2.02798	B = .754454	Phi(1,n) = 187.472
Lat = 45	lon =105	A = 45.0409	B = .707194	Phi(1,n) = 162.609
Lat = 45	lon =115	A = 6.82584	B = .710932	Phi(1,n) = 162.375
Lat = 45	lon =125	A = 5.15235	B = .713861	Phi(1,n) = 158.97
Lat = 49	lon = 75	A = 11.2702	B = .708503	Phi(1,n) = 182.227
Lat = 49	lon = 85	A = 7.8157	B = .710019	Phi(1,n) = 172.757
Lat = 49	lon = 95	A = 2.0021	B = .755816	Phi(1,n) = 150.444
Lat = 49	lon =105	A = 1.85184	B = .764867	Phi(1,n) = 7.25862
Lat = 49	lon =115	A = 2.82211	B = .730406	Phi(1,n) =-6.66574
Lat = 49	lon =125	A = 3.14548	B = .725681	Phi(1,n) = 165.853

TABLE B24 OMEGA OPERATION IN RHO/RHO MODE IN CONUS USING D AND H

Lat = 25	lon = 75	A = 6.20139	B = .711749	Phi(1,n) = 241.088
Lat = 25	lon = 85	A = 11.8276	B = .708374	Phi(1,n) = 243.172
Lat = 25	lon = 95	A = 2.66007	B = .733497	Phi(1,n) = 248.228
Lat = 25	lon =105	A = 1.51473	B = .799577	Phi(1,n) = 74.649
Lat = 25	lon =115	A = 1.14461	B = .899216	Phi(1,n) = 79.8452
Lat = 25	lon =125	A = 1.00934	B = .990916	Phi(1,n) = 172.855
Lat = 30	lon = 75	A = 4.02119	B = .718299	Phi(1,n) = 238.335
Lat = 30	lon = 85	A = 247.448	B = .70711	Phi(1,n) = 240.814
Lat = 30	lon = 95	A = 2.90616	B = .729015	Phi(1,n) = 247.704
Lat = 30	lon =105	A = 1.44539	B = .810751	Phi(1,n) = 76.6766
Lat = 30	lon =115	A = 1.0754	B = .93852	Phi(1,n) = 83.0067
Lat = 30	lon =125	A = 1.07254	B = .940431	Phi(1,n) = 175.823
Lat = 35	lon = 75	A = 2.77037	B = .73133	Phi(1,n) = 234.307
Lat = 35	lon = 85	A = 8.7023	B = .709453	Phi(1,n) = 236.668
Lat = 35	lon = 95	A = 3.38795	B = .72303	Phi(1,n) = 246.248
Lat = 35	lon =105	A = 1.32481	B = .836173	Phi(1,n) = 79.9874
Lat = 35	lon =115	A = 1.01294	B = .987545	Phi(1,n) = 177.608
Lat = 35	lon =125	A = 1.17752	B = .884301	Phi(1,n) = 179.689
Lat = 40	lon = 75	A = 1.97928	B = .757068	Phi(1,n) = 228.622
Lat = 40	lon = 85	A = 3.26821	B = .724262	Phi(1,n) = 229.308
Lat = 40	lon = 95	A = 5.40608	B = .713234	Phi(1,n) = 242.077
Lat = 40	lon =105	A = 1.12162	B = .910933	Phi(1,n) = 86.9322
Lat = 40	lon =115	A = 1.17369	B = .885936	Phi(1,n) = 184.602
Lat = 40	lon =125	A = 1.36509	B = .826653	Phi(1,n) = 184.706
Lat = 45	lon = 75	A = 1.47221	B = .806185	Phi(1,n) = 221.151
Lat = 45	lon = 85	A = 1.66763	B = .780769	Phi(1,n) = 216.998
Lat = 45	lon = 95	A = 3.0474	B = .726947	Phi(1,n) = 221.295
Lat = 45	lon =105	A = 1.3298	B = .834928	Phi(1,n) = 195.631
Lat = 45	lon =115	A = 1.58821	B = .789693	Phi(1,n) = 194.759
Lat = 45	lon =125	A = 1.73402	B = .774421	Phi(1,n) = 190.924
Lat = 49	lon = 75	A = 1.21232	B = .870521	Phi(1,n) = 214.311
Lat = 49	lon = 85	A = 1.16667	B = .88[illegible]8	Phi(1,n) = 204.873
Lat = 49	lon = 95	A = 1.16053	B = .89[illegible]51	Phi(1,n) = 92.2229
Lat = 49	lon =105	A = 4.55727	B = .715775	Phi(1,n) = 38.5942
Lat = 49	lon =115	A = 2.50245	B = .737147	Phi(1,n) = 24.2583
Lat = 49	lon =125	A = 2.33547	B = .74193	Phi(1,n) = 196.468

TABLE B25 OMEGA OPERATION IN RHO/RHO MODE IN CONUS FOR F AND G

Lat = 25	lon = 75	A = 1.28386	B = .847179	Phi(1,n) = 115.704
Lat = 25	lon = 85	A = 1.1533	B = .895078	Phi(1,n) = 112.514
Lat = 25	lon = 95	A = 1.07209	B = .940733	Phi(1,n) = 108.894
Lat = 25	lon =105	A = 1.01953	B = .981548	Phi(1,n) = 105.136
Lat = 25	lon =115	A = 1.01465	B = .985965	Phi(1,n) = 11.3771
Lat = 25	lon =125	A = 1.03743	B = .966349	Phi(1,n) = 7.66657
Lat = 30	lon = 75	A = 1.18963	B = .879293	Phi(1,n) = 118.982
Lat = 30	lon = 85	A = 1.09986	B = .92318	Phi(1,n) = 115.114
Lat = 30	lon = 95	A = 1.04013	B = .964182	Phi(1,n) = 110.945
Lat = 30	lon =105	A = 1.00036	B = .999644	Phi(1,n) = 16.6939
Lat = 30	lon =115	A = 1.02941	B = .972977	Phi(1,n) = 12.4689
Lat = 30	lon =125	A = 1.04907	B = .957232	Phi(1,n) = 8.29644
Lat = 35	lon = 75	A = 1.10015	B = .92301	Phi(1,n) = 122.671
Lat = 35	lon = 85	A = 1.04555	B = .959927	Phi(1,n) = 117.943
Lat = 35	lon = 95	A = 1.00549	B = .994602	Phi(1,n) = 113.124
Lat = 35	lon =105	A = 1.02521	B = .976565	Phi(1,n) = 18.3267
Lat = 35	lon =115	A = 1.04962	B = .956811	Phi(1,n) = 13.5968
Lat = 35	lon =125	A = 1.06587	B = .945007	Phi(1,n) = 8.9416
Lat = 40	lon = 75	A = 1.0193	B = .981756	Phi(1,n) = 126.702
Lat = 40	lon = 85	A = 1.00745	B = .992712	Phi(1,n) = 30.9779
Lat = 40	lon = 95	A = 1.03348	B = .969579	Phi(1,n) = 25.4295
Lat = 40	lon =105	A = 1.05718	B = .951196	Phi(1,n) = 20.0321
Lat = 40	lon =115	A = 1.07622	B = .937972	Phi(1,n) = 14.7661
Lat = 40	lon =125	A = 1.08866	B = .929984	Phi(1,n) = 9.60505
Lat = 45	lon = 75	A = 1.05898	B = .949893	Phi(1,n) = 40.9313
Lat = 45	lon = 85	A = 1.06817	B = .94341	Phi(1,n) = 34.1657
Lat = 45	lon = 95	A = 1.08266	B = .933775	Phi(1,n) = 27.8424
Lat = 45	lon =105	A = 1.09781	B = .924402	Phi(1,n) = 21.808
Lat = 45	lon =115	A = 1.11053	B = .917024	Phi(1,n) = 15.9769
Lat = 45	lon =125	A = 1.11864	B = .912539	Phi(1,n) = 10.2874
Lat = 49	lon = 75	A = 1.13594	B = .903501	Phi(1,n) = 44.3227
Lat = 49	lon = 85	A = 1.12796	B = .907584	Phi(1,n) = 36.7686
Lat = 49	lon = 95	A = 1.13093	B = .906049	Phi(1,n) = 29.826
Lat = 49	lon =105	A = 1.13786	B = .902535	Phi(1,n) = 23.27
Lat = 49	lon =115	A = 1.14474	B = .899157	Phi(1,n) = 16.9722
Lat = 49	lon =125	A = 1.14895	B = .897133	Phi(1,n) = 10.8455

TABLE B26 OMEGA OPERATION IN RHO?RHO MODE IN CONUS FOR F AND H

Lat = 25	lon = 75	A = 5.54632	B = .712925	Phi(1,n) = 74.96
Lat = 25	lon = 85	A = 5.43369	B = .713171	Phi(1,n) = 67.2217
Lat = 25	lon = 95	A = 5.48122	B = .713059	Phi(1,n) = 60.2201
Lat = 25	lon =105	A = 5.64076	B = .712729	Phi(1,n) = 54.0222
Lat = 25	lon =115	A = 5.85887	B = .712314	Phi(1,n) = 48.6237
Lat = 25	lon =125	A = 6.10258	B = .711902	Phi(1,n) = 43.9811
Lat = 30	lon = 75	A = 5.78162	B = .712455	Phi(1,n) = 75.4883
Lat = 30	lon = 85	A = 5.62022	B = .712771	Phi(1,n) = 67.8774
Lat = 30	lon = 95	A = 5.60591	B = .7128	Phi(1,n) = 60.8684
Lat = 30	lon =105	A = 5.6862	B = .712638	Phi(1,n) = 54.531
Lat = 30	lon =115	A = 5.81882	B = .712386	Phi(1,n) = 48.8747
Lat = 30	lon =125	A = 5.96851	B = .712122	Phi(1,n) = 43.8717
Lat = 35	lon = 75	A = 5.98059	B = .712102	Phi(1,n) = 75.8851
Lat = 35	lon = 85	A = 5.77831	B = .712462	Phi(1,n) = 68.3582
Lat = 35	lon = 95	A = 5.70672	B = .712598	Phi(1,n) = 61.3183
Lat = 35	lon =105	A = 5.71847	B = .712575	Phi(1,n) = 54.8317
Lat = 35	lon =115	A = 5.77428	B = .712469	Phi(1,n) = 48.9145
Lat = 35	lon =125	A = 5.84059	B = .712347	Phi(1,n) = 43.5484
Lat = 40	lon = 75	A = 6.14119	B = .711841	Phi(1,n) = 76.1655
Lat = 40	lon = 85	A = 5.90619	B = .71223	Phi(1,n) = 68.6796
Lat = 40	lon = 95	A = 5.78523	B = .712449	Phi(1,n) = 61.5818
Lat = 40	lon =105	A = 5.73648	B = .712541	Phi(1,n) = 54.9308
Lat = 40	lon =115	A = 5.72449	B = .712564	Phi(1,n) = 48.7441
Lat = 40	lon =125	A = 5.71816	B = .712576	Phi(1,n) = 43.0072
Lat = 45	lon = 75	A = 6.26202	B = .711659	Phi(1,n) = 76.3395
Lat = 45	lon = 85	A = 6.00259	B = .712065	Phi(1,n) = 68.8515
Lat = 45	lon = 95	A = 5.84057	B = .712347	Phi(1,n) = 61.6658
Lat = 45	lon =105	A = 5.74001	B = .712534	Phi(1,n) = 54.8306
Lat = 45	lon =115	A = 5.66962	B = .712671	Phi(1,n) = 48.3607
Lat = 45	lon =125	A = 5.60155	B = .712809	Phi(1,n) = 42.2414
Lat = 49	lon = 75	A = 6.32925	B = .711561	Phi(1,n) = 76.4062
Lat = 49	lon = 85	A = 6.05658	B = .711976	Phi(1,n) = 68.885
Lat = 49	lon = 95	A = 5.86807	B = .712297	Phi(1,n) = 61.6052
Lat = 49	lon =105	A = 5.73267	B = .712548	Phi(1,n) = 54.6056
Lat = 49	lon =115	A = 5.62271	B = .712766	Phi(1,n) = 47.8963
Lat = 49	lon =125	A = 5.5134	B = .712995	Phi(1,n) = 41.4606

TABLE B27 OMEGA OPERATION IN RHO/RHO MODE IN CONUS FOR G AND H

Lat = 25	lon = 75	A = 1.08339	B = .933312	Phi(1,n) = 108.379
Lat = 25	lon = 85	A = 1.00514	B = .994939	Phi(1,n) = 195.037
Lat = 25	lon = 95	A = 1.07082	B = .941596	Phi(1,n) = 191.486
Lat = 25	lon =105	A = 1.12637	B = .908416	Phi(1,n) = 187.935
Lat = 25	lon =115	A = 1.1683	B = .888282	Phi(1,n) = 184.445
Lat = 25	lon =125	A = 1.194	B = .877545	Phi(1,n) = 181.013
Lat = 30	lon = 75	A = 1.02735	B = .974722	Phi(1,n) = 111.957
Lat = 30	lon = 85	A = 1.04143	B = .963148	Phi(1,n) = 197.886
Lat = 30	lon = 95	A = 1.10181	B = .922033	Phi(1,n) = 193.698
Lat = 30	lon =105	A = 1.15279	B = .895321	Phi(1,n) = 189.552
Lat = 30	lon =115	A = 1.19142	B = .878576	Phi(1,n) = 185.489
Lat = 30	lon =125	A = 1.21544	B = .869374	Phi(1,n) = 181.492
Lat = 35	lon = 75	A = 1.03269	B = .970229	Phi(1,n) = 205.881
Lat = 35	lon = 85	A = 1.09066	B = .928741	Phi(1,n) = 200.913
Lat = 35	lon = 95	A = 1.14358	B = .89972	Phi(1,n) = 196.006
Lat = 35	lon =105	A = 1.19863	B = .8797	Phi(1,n) = 191.224
Lat = 35	lon =115	A = 1.22314	B = .866595	Phi(1,n) = 186.563
Lat = 35	lon =125	A = 1.24504	B = .85911	Phi(1,n) = 181.988
Lat = 40	lon = 75	A = 1.11254	B = .915901	Phi(1,n) = 210.091
Lat = 40	lon = 85	A = 1.15625	B = .893708	Phi(1,n) = 204.102
Lat = 40	lon = 95	A = 1.19862	B = .875726	Phi(1,n) = 198.409
Lat = 40	lon =105	A = 1.23593	B = .862152	Phi(1,n) = 192.952
Lat = 40	lon =115	A = 1.26523	B = .852704	Phi(1,n) = 187.671
Lat = 40	lon =125	A = 1.28445	B = .84701	Phi(1,n) = 182.502
Lat = 45	lon = 75	A = 1.22042	B = .867567	Phi(1,n) = 214.448
Lat = 45	lon = 85	A = 1.24255	B = .859929	Phi(1,n) = 207.401
Lat = 45	lon = 95	A = 1.27033	B = .851159	Phi(1,n) = 200.889
Lat = 45	lon =105	A = 1.29751	B = .843345	Phi(1,n) = 194.732
Lat = 45	lon =115	A = 1.32025	B = .837328	Phi(1,n) = 188.812
Lat = 45	lon =125	A = 1.33609	B = .833387	Phi(1,n) = 183.035
Lat = 49	lon = 75	A = 1.33126	B = .834566	Phi(1,n) = 217.908
Lat = 49	lon = 85	A = 1.33005	B = .834866	Phi(1,n) = 210.064
Lat = 49	lon = 95	A = 1.31266	B = .831808	Phi(1,n) = 202.905
Lat = 49	lon =105	A = 1.35969	B = .827862	Phi(1,n) = 196.185
Lat = 49	lon =115	A = 1.37596	B = .824278	Phi(1,n) = 189.748
Lat = 49	lon =125	A = 1.38847	B = .821637	Phi(1,n) = 183.177

TABLE B28 OMEGA OPERATION IN RHO/RHO MODE FOR C, D AND F IN CONUS

Lat = 25	lon = 75	A = 1.05493	B = .689831	Phi(1,n) = 235.3
Lat = 25	lon = 85	A = 1.02011	B = .700306	Phi(1,n) = 245.911
Lat = 25	lon = 95	A = .981318	B = .714002	Phi(1,n) = 267.044
Lat = 25	lon =105	A = .989792	B = .710801	Phi(1,n) = 103.583
Lat = 25	lon =115	A = 1.03569	B = .695428	Phi(1,n) = 180.366
Lat = 25	lon =125	A = 1.13022	B = .671587	Phi(1,n) = 175.772
Lat = 30	lon = 75	A = 1.06209	B = .687859	Phi(1,n) = 229.914
Lat = 30	lon = 85	A = 1.01259	B = .702778	Phi(1,n) = 240.723
Lat = 30	lon = 95	A = .964082	B = .720919	Phi(1,n) = 179.478
Lat = 30	lon =105	A = .972022	B = .717661	Phi(1,n) = 99.6415
Lat = 30	lon =115	A = 1.04404	B = .692945	Phi(1,n) = 176.067
Lat = 30	lon =125	A = 1.12804	B = .672046	Phi(1,n) = 172.093
Lat = 35	lon = 75	A = 1.07562	B = .684279	Phi(1,n) = 222.999
Lat = 35	lon = 85	A = 1.01929	B = .700571	Phi(1,n) = 232.074
Lat = 35	lon = 95	A = .949259	B = .727348	Phi(1,n) = 179.654
Lat = 35	lon =105	A = .957736	B = .723614	Phi(1,n) = 182.905
Lat = 35	lon =115	A = 1.06209	B = .687858	Phi(1,n) = 172.3
Lat = 35	lon =125	A = 1.1104	B = .675899	Phi(1,n) = 168.848
Lat = 40	lon = 75	A = 1.09141	B = .680336	Phi(1,n) = 214.476
Lat = 40	lon = 85	A = 1.05188	B = .69069	Phi(1,n) = 218.807
Lat = 40	lon = 95	A = .930602	B = .736152	Phi(1,n) = 170.5
Lat = 40	lon =105	A = .981722	B = .713846	Phi(1,n) = 173.824
Lat = 40	lon =115	A = 1.08573	B = .681726	Phi(1,n) = 171.511
Lat = 40	lon =125	A = 1.07423	B = .681638	Phi(1,n) = 167.206
Lat = 45	lon = 75	A = 1.09307	B = .679935	Phi(1,n) = 204.741
Lat = 45	lon = 85	A = 1.09321	B = .679901	Phi(1,n) = 201.481
Lat = 45	lon = 95	A = 1.02504	B = .698727	Phi(1,n) = 209.061
Lat = 45	lon =105	A = 1.08509	B = .681886	Phi(1,n) = 179.45
Lat = 45	lon =115	A = 1.06001	B = .688426	Phi(1,n) = 176.426
Lat = 45	lon =125	A = 1.00859	B = .704126	Phi(1,n) = 168.117
Lat = 49	lon = 75	A = 1.06952	B = .68587	Phi(1,n) = 196.883
Lat = 49	lon = 85	A = 1.06134	B = .688061	Phi(1,n) = 187.997
Lat = 49	lon = 95	A = .948632	B = .72763	Phi(1,n) = 173.348
Lat = 49	lon =105	A = .941394	B = .730957	Phi(1,n) = 207.879
Lat = 49	lon =115	A = .969881	B = .718526	Phi(1,n) = 185.226
Lat = 49	lon =125	A = .937315	B = .732886	Phi(1,n) = 170.87

TABLE B29 OMEGA OPERATION IN RHO/RHO MODE IN CONUS FOR C, D AND G

Lat = 25	lon = 75	A = 1.28489	B = .646267	Phi(1,n) = 198.846
Lat = 25	lon = 85	A = 1.19983	B = .658613	Phi(1,n) = 200.936
Lat = 25	lon = 95	A = 1.06417	B = .687295	Phi(1,n) = 200.476
Lat = 25	lon =105	A = 1.01528	B = .701883	Phi(1,n) = 111.612
Lat = 25	lon =115	A = 1.14116	B = .669334	Phi(1,n) = 130.488
Lat = 25	lon =125	A = 1.30976	B = .643214	Phi(1,n) = 138.722
Lat = 30	lon = 75	A = 1.48996	B = .62628	Phi(1,n) = 197.902
Lat = 30	lon = 85	A = 1.3245	B = .641504	Phi(1,n) = 200.746
Lat = 30	lon = 95	A = 1.08568	B = .68174	Phi(1,n) = 202.05
Lat = 30	lon =105	A = 1.07892	B = .683436	Phi(1,n) = 122.574
Lat = 30	lon =115	A = 1.362	B = .637457	Phi(1,n) = 137.938
Lat = 30	lon =125	A = 1.76344	B = .611027	Phi(1,n) = 143.397
Lat = 35	lon = 75	A = 1.8749	B = .606839	Phi(1,n) = 196.078
Lat = 35	lon = 85	A = 1.55733	B = .621649	Phi(1,n) = 199.171
Lat = 35	lon = 95	A = 1.11615	B = .674614	Phi(1,n) = 203.851
Lat = 35	lon =105	A = 1.22509	B = .654601	Phi(1,n) = 132.223
Lat = 35	lon =115	A = 1.8497	B = .607712	Phi(1,n) = 144.647
Lat = 35	lon =125	A = 2.94257	B = .588795	Phi(1,n) = 147.583
Lat = 40	lon = 75	A = 2.77959	B = .590223	Phi(1,n) = 192.791
Lat = 40	lon = 85	A = 2.1638	B = .599069	Phi(1,n) = 194.411
Lat = 40	lon = 95	A = 1.20767	B = .657334	Phi(1,n) = 204.341
Lat = 40	lon =105	A = 1.64577	B = .616533	Phi(1,n) = 143.217
Lat = 40	lon =115	A = 3.53279	B = .585218	Phi(1,n) = 152.538
Lat = 40	lon =125	A = 9.49594	B = .57842	Phi(1,n) = 152.481
Lat = 45	lon = 75	A = 5.94586	B = .580092	Phi(1,n) = 187.723
Lat = 45	lon = 85	A = 5.31518	B = .580787	Phi(1,n) = 184.208
Lat = 45	lon = 95	A = 2.49707	B = .59343	Phi(1,n) = 188.804
Lat = 45	lon =105	A = 7.68238	B = .578988	Phi(1,n) = 163.878
Lat = 45	lon =115	A = 8.8767	B = .578575	Phi(1,n) = 163.038
Lat = 45	lon =125	A = 4.71601	B = .581726	Phi(1,n) = 158.751
Lat = 49	lon = 75	A = 7.09616	B = .579271	Phi(1,n) = 182.798
Lat = 49	lon = 85	A = 5.32793	B = .58077	Phi(1,n) = 173.414
Lat = 49	lon = 95	A = 1.85638	B = .607477	Phi(1,n) = 150.729
Lat = 49	lon =105	A = 1.90008	B = .606003	Phi(1,n) = 187.363
Lat = 49	lon =115	A = 2.6039	B = .592088	Phi(1,n) = 173.024
Lat = 49	lon =125	A = 2.36477	B = .595367	Phi(1,n) = 164.89

TABLE B30 OMEGA OPERATION IN RHO/RHO MODE IN CONUS FOR C, D AND H

Lat = 25	lon = 75	A = 1.24005	B = .652372	Phi(1,n) = 233.367
Lat = 25	lon = 85	A = 1.16727	B = .6643	Phi(1,n) = 240.433
Lat = 25	lon = 95	A = 1.05304	B = .690363	Phi(1,n) = 255.175
Lat = 25	lon =105	A = 1.01282	B = .7027	Phi(1,n) = 179.481
Lat = 25	lon =115	A = 1.1324	B = .671131	Phi(1,n) = 172.054
Lat = 25	lon =125	A = 1.28495	B = .646259	Phi(1,n) = 170.509
Lat = 30	lon = 75	A = 1.21537	B = .651603	Phi(1,n) = 229.029
Lat = 30	lon = 85	A = 1.16008	B = .665641	Phi(1,n) = 236.557
Lat = 30	lon = 95	A = 1.02776	B = .697872	Phi(1,n) = 256.696
Lat = 30	lon =105	A = 1.02728	B = .69802	Phi(1,n) = 176.743
Lat = 30	lon =115	A = 1.18418	B = .66127	Phi(1,n) = 170.63
Lat = 30	lon =125	A = 1.33006	B = .640877	Phi(1,n) = 169.224
Lat = 35	lon = 75	A = 1.26032	B = .649509	Phi(1,n) = 223.157
Lat = 35	lon = 85	A = 1.17451	B = .662981	Phi(1,n) = 229.831
Lat = 35	lon = 95	A = 1.01069	B = .703418	Phi(1,n) = 256.304
Lat = 35	lon =105	A = 1.05009	B = .691199	Phi(1,n) = 173.38
Lat = 35	lon =115	A = 1.24086	B = .652254	Phi(1,n) = 170.164
Lat = 35	lon =125	A = 1.32368	B = .641597	Phi(1,n) = 168.681
Lat = 40	lon = 75	A = 1.27759	B = .647205	Phi(1,n) = 215.576
Lat = 40	lon = 85	A = 1.22529	B = .65457	Phi(1,n) = 218.801
Lat = 40	lon = 95	A = 1.00757	B = .704477	Phi(1,n) = 248.633
Lat = 40	lon =105	A = 1.11891	B = .674008	Phi(1,n) = 171.155
Lat = 40	lon =115	A = 1.28652	B = .64606	Phi(1,n) = 172.351
Lat = 40	lon =125	A = 1.25907	B = .649681	Phi(1,n) = 169.84
Lat = 45	lon = 75	A = 1.27186	B = .647957	Phi(1,n) = 206.612
Lat = 45	lon = 85	A = 1.28361	B = .646431	Phi(1,n) = 203.113
Lat = 45	lon = 95	A = 1.18486	B = .661152	Phi(1,n) = 209.979
Lat = 45	lon =105	A = 1.27949	B = .64696	Phi(1,n) = 181.481
Lat = 45	lon =115	A = 1.2355	B = .653038	Phi(1,n) = 179.54
Lat = 45	lon =125	A = 1.14372	B = .668821	Phi(1,n) = 173.807
Lat = 49	lon = 75	A = 1.2304	B = .653798	Phi(1,n) = 199.271
Lat = 49	lon = 85	A = 1.22769	B = .654206	Phi(1,n) = 190.359
Lat = 49	lon = 95	A = 1.07084	B = .685521	Phi(1,n) = 173.708
Lat = 49	lon =105	A = 1.06316	B = .687568	Phi(1,n) = 209.294
Lat = 49	lon =115	A = 1.09715	B = .67896	Phi(1,n) = 190.051
Lat = 49	lon =125	A = 1.03754	B = .69487	Phi(1,n) = 180.024

TABLE B31 OMEGA OPERATION IN RHO/RHO MODE IN CONUS USING C< F AND G

Lat = 25	lon = 75	A = 1.06533	B = .686982	Phi(1,n) = 202.867
Lat = 25	lon = 85	A = 1.12944	B = .67175	Phi(1,n) = 202.041
Lat = 25	lon = 95	A = 1.19126	B = .660051	Phi(1,n) = 199.833
Lat = 25	lon =105	A = 1.24694	B = .651379	Phi(1,n) = 196.927
Lat = 25	lon =115	A = 1.29223	B = .645343	Phi(1,n) = 193.64
Lat = 25	lon =125	A = 1.32331	B = .64164	Phi(1,n) = 190.067
Lat = 30	lon = 75	A = 1.10801	B = .676439	Phi(1,n) = 206.072
Lat = 30	lon = 85	A = 1.16314	B = .665067	Phi(1,n) = 203.829
Lat = 30	lon = 95	A = 1.21518	B = .656136	Phi(1,n) = 200.656
Lat = 30	lon =105	A = 1.26041	B = .649497	Phi(1,n) = 196.954
Lat = 30	lon =115	A = 1.29341	B = .645197	Phi(1,n) = 192.891
Lat = 30	lon =125	A = 1.30565	B = .643703	Phi(1,n) = 188.473
Lat = 35	lon = 75	A = 1.14838	B = .667896	Phi(1,n) = 209.958
Lat = 35	lon = 85	A = 1.18929	B = .660387	Phi(1,n) = 206.233
Lat = 35	lon = 95	A = 1.22641	B = .654401	Phi(1,n) = 202.049
Lat = 35	lon =105	A = 1.25449	B = .650315	Phi(1,n) = 197.563
Lat = 35	lon =115	A = 1.26551	B = .648805	Phi(1,n) = 192.843
Lat = 35	lon =125	A = 1.24606	B = .651505	Phi(1,n) = 187.924
Lat = 40	lon = 75	A = 1.17818	B = .662325	Phi(1,n) = 214.476
Lat = 40	lon = 85	A = 1.20187	B = .658278	Phi(1,n) = 209.251
Lat = 40	lon = 95	A = 1.22111	B = .655212	Phi(1,n) = 204.049
Lat = 40	lon =105	A = 1.22906	B = .654	Phi(1,n) = 198.829
Lat = 40	lon =115	A = 1.2165	B = .65593	Phi(1,n) = 193.611
Lat = 40	lon =125	A = 1.17099	B = .663618	Phi(1,n) = 188.585
Lat = 45	lon = 75	A = 1.18877	B = .660477	Phi(1,n) = 219.52
Lat = 45	lon = 85	A = 1.19671	B = .659132	Phi(1,n) = 212.875
Lat = 45	lon = 95	A = 1.19914	B = .658728	Phi(1,n) = 206.707
Lat = 45	lon =105	A = 1.18923	B = .660398	Phi(1,n) = 200.846
Lat = 45	lon =115	A = 1.15928	B = .665793	Phi(1,n) = 195.332
Lat = 45	lon =125	A = 1.10217	B = .677782	Phi(1,n) = 190.62
Lat = 49	lon = 75	A = 1.1808	B = .661861	Phi(1,n) = 223.84
Lat = 49	lon = 85	A = 1.17988	B = .662023	Phi(1,n) = 216.2
Lat = 49	lon = 95	A = 1.17214	B = .663409	Phi(1,n) = 209.348
Lat = 49	lon =105	A = 1.15231	B = .66713	Phi(1,n) = 203.077
Lat = 49	lon =115	A = 1.11522	B = .67482	Phi(1,n) = 197.49
Lat = 49	lon =125	A = 1.05851	B = .688838	Phi(1,n) = 193.3

TABLE B32 OMEGA OPERATION IN RHO/RHO MODE IN CONUS USING C,F AND H

Lat	lon	A	B	Phi(1,n)
Lat = 25	lon = 75	A = 1.04534	B = .692567	Phi(1,n) = 258.095
Lat = 25	lon = 85	A = 1.1047	B = .677196	Phi(1,n) = 247.745
Lat = 25	lon = 95	A = 1.16871	B = .664034	Phi(1,n) = 239.202
Lat = 25	lon =105	A = 1.22933	B = .653958	Phi(1,n) = 232.129
Lat = 25	lon =115	A = 1.2767	B = .647322	Phi(1,n) = 226.255
Lat = 25	lon =125	A = 1.29751	B = .64469	Phi(1,n) = 221.4
Lat = 30	lon = 75	A = 1.02355	B = .699202	Phi(1,n) = 260.021
Lat = 30	lon = 85	A = 1.06365	B = .687434	Phi(1,n) = 249.913
Lat = 30	lon = 95	A = 1.10303	B = .677583	Phi(1,n) = 241.33
Lat = 30	lon =105	A = 1.13351	B = .670899	Phi(1,n) = 234.106
Lat = 30	lon =115	A = 1.14501	B = .668564	Phi(1,n) = 228.123
Lat = 30	lon =125	A = 1.12488	B = .672718	Phi(1,n) = 223.498
Lat = 35	lon = 75	A = 1.00442	B = .705559	Phi(1,n) = 262.134
Lat = 35	lon = 85	A = 1.02951	B = .697326	Phi(1,n) = 252.405
Lat = 35	lon = 95	A = 1.05087	B = .690975	Phi(1,n) = 243.978
Lat = 35	lon =105	A = 1.06162	B = .687985	Phi(1,n) = 236.894
Lat = 35	lon =115	A = 1.05403	B = .690083	Phi(1,n) = 231.339
Lat = 35	lon =125	A = 1.0214	B = .699889	Phi(1,n) = 228.212
Lat = 40	lon = 75	A = .987988	B = .711471	Phi(1,n) = 264.494
Lat = 40	lon = 85	A = 1.00186	B = .706451	Phi(1,n) = 255.32
Lat = 40	lon = 95	A = 1.01088	B = .703354	Phi(1,n) = 247.322
Lat = 40	lon =105	A = 1.01016	B = .703596	Phi(1,n) = 240.802
Lat = 40	lon =115	A = .995745	B = .708626	Phi(1,n) = 236.424
Lat = 40	lon =125	A = .969477	B = .718692	Phi(1,n) = 236.177
Lat = 45	lon = 75	A = .974405	B = .716708	Phi(1,n) = 267.136
Lat = 45	lon = 85	A = .9806	B = .714278	Phi(1,n) = 258.708
Lat = 45	lon = 95	A = .982245	B = .713645	Phi(1,n) = 251.445
Lat = 45	lon =105	A = .976937	B = .715706	Phi(1,n) = 245.923
Lat = 45	lon =115	A = .965109	B = .72049	Phi(1,n) = 153.229
Lat = 45	lon =125	A = .956774	B = .724029	Phi(1,n) = 155.27
Lat = 49	lon = 75	A = .965742	B = .720228	Phi(1,n) = 269.454
Lat = 49	lon = 85	A = .968155	B = .719232	Phi(1,n) = 261.724
Lat = 49	lon = 95	A = .967099	B = .719666	Phi(1,n) = 255.205
Lat = 49	lon =105	A = .962184	B = .721716	Phi(1,n) = 160.598
Lat = 49	lon =115	A = .956943	B = .723956	Phi(1,n) = 158.93
Lat = 49	lon =125	A = .96427	B = .72084	Phi(1,n) = 160.869

TABLE B33 OMEGA OPERATION IN RHO/RHO MODE IN CONUS USING C, G AND H

Lat = 25	lon = 75	A = 1.15776	B = .666082	Phi(1,n) = 193.318
Lat = 25	lon = 85	A = 1.25637	B = .650053	Phi(1,n) = 189.551
Lat = 25	lon = 95	A = 1.34747	B = .638976	Phi(1,n) = 186.073
Lat = 25	lon =105	A = 1.42174	B = .631527	Phi(1,n) = 182.696
Lat = 25	lon =115	A = 1.48231	B = .626854	Phi(1,n) = 179.324
Lat = 25	lon =125	A = 1.51452	B = .624508	Phi(1,n) = 175.829
Lat = 30	lon = 75	A = 1.18839	B = .660543	Phi(1,n) = 194.242
Lat = 30	lon = 85	A = 1.27338	B = .647757	Phi(1,n) = 190.258
Lat = 30	lon = 95	A = 1.34944	B = .638766	Phi(1,n) = 186.287
Lat = 30	lon =105	A = 1.4101	B = .632825	Phi(1,n) = 182.25
Lat = 30	lon =115	A = 1.44709	B = .629634	Phi(1,n) = 178.028
Lat = 30	lon =125	A = 1.44778	B = .629577	Phi(1,n) = 173.356
Lat = 35	lon = 75	A = 1.22044	B = .655316	Phi(1,n) = 195.669
Lat = 35	lon = 85	A = 1.29526	B = .64622	Phi(1,n) = 191.133
Lat = 35	lon = 95	A = 1.34017	B = .639762	Phi(1,n) = 186.5
Lat = 35	lon =105	A = 1.37722	B = .635927	Phi(1,n) = 181.694
Lat = 35	lon =115	A = 1.38561	B = .63511	Phi(1,n) = 176.532
Lat = 35	lon =125	A = 1.31966	B = .638742	Phi(1,n) = 170.586
Lat = 40	lon = 75	A = 1.24586	B = .651533	Phi(1,n) = 197.684
Lat = 40	lon = 85	A = 1.28713	B = .645983	Phi(1,n) = 192.259
Lat = 40	lon = 95	A = 1.31846	B = .642196	Phi(1,n) = 186.795
Lat = 40	lon =105	A = 1.3307	B = .640806	Phi(1,n) = 181.123
Lat = 40	lon =115	A = 1.31307	B = .642824	Phi(1,n) = 174.964
Lat = 40	lon =125	A = 1.25351	B = .650451	Phi(1,n) = 167.743
Lat = 45	lon = 75	A = 1.25104	B = .650378	Phi(1,n) = 200.249
Lat = 45	lon = 85	A = 1.27423	B = .647645	Phi(1,n) = 193.685
Lat = 45	lon = 95	A = 1.28111	B = .646328	Phi(1,n) = 187.252
Lat = 45	lon =105	A = 1.27617	B = .647391	Phi(1,n) = 180.642
Lat = 45	lon =115	A = 1.24121	B = .652203	Phi(1,n) = 173.476
Lat = 45	lon =125	A = 1.17346	B = .66317	Phi(1,n) = 165.073
Lat = 49	lon = 75	A = 1.24306	B = .651935	Phi(1,n) = 202.604
Lat = 49	lon = 85	A = 1.25168	B = .650708	Phi(1,n) = 195.047
Lat = 49	lon = 95	A = 1.24944	B = .651023	Phi(1,n) = 187.782
Lat = 49	lon =105	A = 1.23016	B = .653834	Phi(1,n) = 180.399
Lat = 49	lon =115	A = 1.18836	B = .660547	Phi(1,n) = 172.456
Lat = 49	lon =125	A = 1.12197	B = .673343	Phi(1,n) = 163.233

TABLE B34 OMEGA OPERATION IN RHO/RHO MODE IN CONUS FOR D, F AND G

Lat = 25	lon = 75	A = .953221	B = .725583	Phi(1,n) = 242.662
Lat = 25	lon = 85	A = 1.00685	B = .704722	Phi(1,n) = 256.751
Lat = 25	lon = 95	A = 1.13205	B = .671204	Phi(1,n) = 270.896
Lat = 25	lon =105	A = 1.26976	B = .648236	Phi(1,n) = 99.1377
Lat = 25	lon =115	A = 1.23138	B = .653651	Phi(1,n) = 101.999
Lat = 25	lon =125	A = 1.10995	B = .676	Phi(1,n) = 101.039
Lat = 30	lon = 75	A = 1.00074	B = .706845	Phi(1,n) = 228.175
Lat = 30	lon = 85	A = .990351	B = .710594	Phi(1,n) = 243.726
Lat = 30	lon = 95	A = 1.07768	B = .683751	Phi(1,n) = 268.651
Lat = 30	lon =105	A = 1.25227	B = .650625	Phi(1,n) = 101.533
Lat = 30	lon =115	A = 1.18754	B = .660687	Phi(1,n) = 104.453
Lat = 30	lon =125	A = 1.05375	B = .690161	Phi(1,n) = 102.007
Lat = 35	lon = 75	A = 1.11748	B = .67432	Phi(1,n) = 220.647
Lat = 35	lon = 85	A = 1.05374	B = .690164	Phi(1,n) = 228.638
Lat = 35	lon = 95	A = 1.02508	B = .698714	Phi(1,n) = 262.886
Lat = 35	lon =105	A = 1.23564	B = .653017	Phi(1,n) = 105.147
Lat = 35	lon =115	A = 1.11044	B = .675888	Phi(1,n) = 107.207
Lat = 35	lon =125	A = 1.02026	B = .700257	Phi(1,n) = 190.903
Lat = 40	lon = 75	A = 1.24689	B = .651386	Phi(1,n) = 218.161
Lat = 40	lon = 85	A = 1.23439	B = .653202	Phi(1,n) = 218.386
Lat = 40	lon = 95	A = 1.00208	B = .706374	Phi(1,n) = 246.456
Lat = 40	lon =105	A = 1.1919	B = .659943	Phi(1,n) = 111.21
Lat = 40	lon =115	A = 1.01498	B = .701984	Phi(1,n) = 197.49
Lat = 40	lon =125	A = 1.13949	B = .669674	Phi(1,n) = 188.795
Lat = 45	lon = 75	A = 1.2073	B = .657392	Phi(1,n) = 219.591
Lat = 45	lon = 85	A = 1.28114	B = .646747	Phi(1,n) = 213.562
Lat = 45	lon = 95	A = 1.36928	B = .636718	Phi(1,n) = 212.859
Lat = 45	lon =105	A = 1.11861	B = .674074	Phi(1,n) = 201.424
Lat = 45	lon =115	A = 1.25859	B = .649747	Phi(1,n) = 195.212
Lat = 45	lon =125	A = 1.31712	B = .642352	Phi(1,n) = 189.947
Lat = 49	lon = 75	A = 1.05326	B = .6903	Phi(1,n) = 226.716
Lat = 49	lon = 85	A = 1.0166	B = .70145	Phi(1,n) = 221.302
Lat = 49	lon = 95	A = 1.14447	B = .668672	Phi(1,n) = 120.309
Lat = 49	lon =105	A = 1.39619	B = .634105	Phi(1,n) = 30.4616
Lat = 49	lon =115	A = 1.4651	B = .628182	Phi(1,n) = 19.3736
Lat = 49	lon =125	A = 1.45767	B = .628773	Phi(1,n) = 192.59

TABLE B35 OMEGA OPERATION IN RHO./RHO MODE IN CONUS FOR D, G AND H

Lat = 25	lon = 75	A = 2.59797	B = .592158	Phi(1,n) = 253.11
Lat = 25	lon = 85	A = 7.16643	B = .579233	Phi(1,n) = 248.354
Lat = 25	lon = 95	A = 2.11646	B = .60011	Phi(1,n) = 245.554
Lat = 25	lon =105	A = 1.1442	B = .668724	Phi(1,n) = 62.2242
Lat = 25	lon =115	A = .887619	B = .760121	Phi(1,n) = 44.0973
Lat = 25	lon =125	A = .908354	B = .747846	Phi(1,n) = 87.6758
Lat = 30	lon = 75	A = 1.9966	B = .603116	Phi(1,n) = 252.896
Lat = 30	lon = 85	A = 5.74802	B = .580285	Phi(1,n) = 247.93
Lat = 30	lon = 95	A = 2.33367	B = .595874	Phi(1,n) = 245.737
Lat = 30	lon =105	A = 1.09112	B = .680406	Phi(1,n) = 62.6313
Lat = 30	lon =115	A = .868509	B = .772833	Phi(1,n) = 115.129
Lat = 30	lon =125	A = .952749	B = .725791	Phi(1,n) = 83.1354
Lat = 35	lon = 75	A = 1.53444	B = .623143	Phi(1,n) = 252.862
Lat = 35	lon = 85	A = 3.17515	B = .587138	Phi(1,n) = 246.973
Lat = 35	lon = 95	A = 2.77597	B = .590258	Phi(1,n) = 245.474
Lat = 35	lon =105	A = 1.00281	B = .706118	Phi(1,n) = 61.9961
Lat = 35	lon =115	A = .906148	B = .749084	Phi(1,n) = 92.0615
Lat = 35	lon =125	A = .983839	B = .713036	Phi(1,n) = 169.146
Lat = 40	lon = 75	A = 1.19529	B = .659371	Phi(1,n) = 254.436
Lat = 40	lon = 85	A = 1.73069	B = .612433	Phi(1,n) = 245.769
Lat = 40	lon = 95	A = 4.67884	B = .581797	Phi(1,n) = 244.139
Lat = 40	lon =105	A = .877634	B = .766581	Phi(1,n) = 136.224
Lat = 40	lon =115	A = .987642	B = .711601	Phi(1,n) = 174.838
Lat = 40	lon =125	A = .959634	B = .722799	Phi(1,n) = 150.527
Lat = 45	lon = 75	A = .985788	B = .712297	Phi(1,n) = 264.88
Lat = 45	lon = 85	A = 1.05731	B = .689168	Phi(1,n) = 250.926
Lat = 45	lon = 95	A = 1.64011	B = .616832	Phi(1,n) = 238.707
Lat = 45	lon =105	A = .956309	B = .724231	Phi(1,n) = 165.564
Lat = 45	lon =115	A = 1.02227	B = .699611	Phi(1,n) = 233.116
Lat = 45	lon =125	A = 1.07908	B = .683395	Phi(1,n) = 223.585
Lat = 49	lon = 75	A = .963998	B = .720954	Phi(1,n) = 197.929
Lat = 49	lon = 85	A = .985663	B = .712344	Phi(1,n) = 195.118
Lat = 49	lon = 95	A = .89562	B = .755212	Phi(1,n) = 59.5503
Lat = 49	lon =105	A = 2.16861	B = .598967	Phi(1,n) = 52.2299
Lat = 49	lon =115	A = 1.40719	B = .633089	Phi(1,n) = 45.1063
Lat = 49	lon =125	A = 1.33283	B = .640569	Phi(1,n) = 218.935

TABLE B36 OMEGA OPERATION IN RHO/RHO MODE IN CONUS USING D, F AND H

Lat = 25	lon = 75	A = 2.59797	B = .592158	Phi(1,n) = 253.11
Lat = 25	lon = 85	A = 7.16643	B = .579233	Phi(1,n) = 248.354
Lat = 25	lon = 95	A = 2.11646	B = .60011	Phi(1,n) = 245.554
Lat = 25	lon =105	A = 1.1442	B = .668724	Phi(1,n) = 62.2242
Lat = 25	lon =115	A = .887619	B = .760121	Phi(1,n) = 44.0973
Lat = 25	lon =125	A = .908354	B = .747846	Phi(1,n) = 87.6758
Lat = 30	lon = 75	A = 1.9966	B = .603116	Phi(1,n) = 252.896
Lat = 30	lon = 85	A = 5.74802	B = .580285	Phi(1,n) = 247.93
Lat = 30	lon = 95	A = 2.33367	B = .595874	Phi(1,n) = 245.737
Lat = 30	lon =105	A = 1.09112	B = .680406	Phi(1,n) = 62.6313
Lat = 30	lon =115	A = .868509	B = .772833	Phi(1,n) = 115.129
Lat = 30	lon =125	A = .952749	B = .725791	Phi(1,n) = 83.1354
Lat = 35	lon = 75	A = 1.53444	B = .623143	Phi(1,n) = 252.862
Lat = 35	lon = 85	A = 3.17515	B = .587138	Phi(1,n) = 246.973
Lat = 35	lon = 95	A = 2.77597	B = .590258	Phi(1,n) = 245.474
Lat = 35	lon =105	A = 1.00281	B = .706118	Phi(1,n) = 61.9961
Lat = 35	lon =115	A = .906148	B = .749084	Phi(1,n) = 92.0615
Lat = 35	lon =125	A = .983839	B = .713036	Phi(1,n) = 169.146
Lat = 40	lon = 75	A = 1.19529	B = .659371	Phi(1,n) = 254.436
Lat = 40	lon = 85	A = 1.73069	B = .612433	Phi(1,n) = 245.769
Lat = 40	lon = 95	A = 4.67884	B = .581797	Phi(1,n) = 244.139
Lat = 40	lon =105	A = .877634	B = .766581	Phi(1,n) = 136.224
Lat = 40	lon =115	A = .987642	B = .711601	Phi(1,n) = 174.838
Lat = 40	lon =125	A = .959634	B = .722799	Phi(1,n) = 150.527
Lat = 45	lon = 75	A = .985788	B = .712297	Phi(1,n) = 264.88
Lat = 45	lon = 85	A = 1.05731	B = .689168	Phi(1,n) = 250.926
Lat = 45	lon = 95	A = 1.64011	B = .616832	Phi(1,n) = 238.707
Lat = 45	lon =105	A = .956309	B = .724231	Phi(1,n) = 165.564
Lat = 45	lon =115	A = 1.02227	B = .699611	Phi(1,n) = 233.116
Lat = 45	lon =125	A = 1.07908	B = .683395	Phi(1,n) = 223.585
Lat = 49	lon = 75	A = .963998	B = .720954	Phi(1,n) = 197.929
Lat = 49	lon = 85	A = .985663	B = .712344	Phi(1,n) = 195.118
Lat = 49	lon = 95	A = .89562	B = .755212	Phi(1,n) = 59.5503
Lat = 49	lon =105	A = 2.16861	B = .598967	Phi(1,n) = 52.2299
Lat = 49	lon =115	A = 1.40719	B = .633089	Phi(1,n) = 45.1063
Lat = 49	lon =125	A = 1.33283	B = .640569	Phi(1,n) = 218.935

TABLE B37 OMEGA OPERATION IN RHO/RHO MODE IN CONUS FOR F, G AND H

Lat	lon	A	B	Phi(1,n)
25	75	1.25461	.650298	107.485
25	85	1.13648	.670287	102.468
25	95	1.06379	.687398	97.0705
25	105	1.01722	.701246	91.7154
25	115	1.01302	.702633	-1.75949
25	125	1.03376	.696016	-4.02847
30	75	1.17145	.663534	110.093
30	85	1.08922	.680869	104.322
30	95	1.0355	.695488	98.3049
30	105	1.00031	.706996	2.42634
30	115	1.02619	.698363	-.117821
30	125	1.01413	.692919	-3.25583
35	75	1.09071	.680507	112.546
35	85	1.04064	.693947	105.882
35	95	1.00183	.705417	99.1806
35	105	1.02233	.69959	5.33982
35	115	1.04129	.69287	1.66985
35	125	1.05911	.688672	-2.33098
40	75	1.01737	.701198	114.376
40	85	1.00662	.704799	17.6057
40	95	1.0298	.697234	12.9321
40	105	1.05103	.69093	8.27895
40	115	1.06819	.68622	3.56419
40	125	1.07942	.683308	-1.2754
45	75	1.05366	.690188	30.2303
45	85	1.06156	.688001	23.2678
45	95	1.07435	.684607	17.0396
45	105	1.08778	.68122	11.1959
45	115	1.09906	.678511	5.52629
45	125	1.10611	.676873	-.114802
49	75	1.12477	.672741	35.44
49	85	1.11644	.67455	27.3369
49	95	1.11841	.674118	20.1431
49	105	1.12412	.672879	13.4852
49	115	1.12981	.671672	7.11927
49	125	1.13302	.671001	.870347

TABLE B38 OMEGA OPERATION IN RHO/RHO MODE IN CONUS FOR C, D, F AND G

Lat = 25	lon = 75	A = .891998	B = .603772	Phi(1,n) = 214.286
Lat = 25	lon = 85	A = .897105	B = .602207	Phi(1,n) = 225.305
Lat = 25	lon = 95	A = .889139	B = .604665	Phi(1,n) = 245.988
Lat = 25	lon =105	A = .901934	B = .600764	Phi(1,n) = 84.0571
Lat = 25	lon =115	A = .935747	B = .591524	Phi(1,n) = 163.407
Lat = 25	lon =125	A = 1.00052	B = .577251	Phi(1,n) = 161.715
Lat = 30	lon = 75	A = .934221	B = .59191	Phi(1,n) = 212.296
Lat = 30	lon = 85	A = .923191	B = .594787	Phi(1,n) = 223.113
Lat = 30	lon = 95	A = .902796	B = .600509	Phi(1,n) = 161.257
Lat = 30	lon =105	A = .915901	B = .59677	Phi(1,n) = 83.0908
Lat = 30	lon =115	A = .976401	B = .582116	Phi(1,n) = 162.946
Lat = 30	lon =125	A = 1.0533	B = .568086	Phi(1,n) = 161.7
Lat = 35	lon = 75	A = .986012	B = .58012	Phi(1,n) = 209.364
Lat = 35	lon = 85	A = .958569	B = .586041	Phi(1,n) = 218.372
Lat = 35	lon = 95	A = .913487	B = .597442	Phi(1,n) = 164.936
Lat = 35	lon =105	A = .926642	B = .593872	Phi(1,n) = 169.946
Lat = 35	lon =115	A = 1.02288	B = .57314	Phi(1,n) = 163.174
Lat = 35	lon =125	A = 1.08057	B = .564013	Phi(1,n) = 162.113
Lat = 40	lon = 75	A = 1.04176	B = .569935	Phi(1,n) = 205.126
Lat = 40	lon = 85	A = 1.01499	B = .574549	Phi(1,n) = 209.632
Lat = 40	lon = 95	A = .914605	B = .59713	Phi(1,n) = 159.69
Lat = 40	lon =105	A = .96531	B = .584522	Phi(1,n) = 165.69
Lat = 40	lon =115	A = 1.06979	B = .565575	Phi(1,n) = 166.235
Lat = 40	lon =125	A = 1.06905	B = .565685	Phi(1,n) = 164.103
Lat = 45	lon = 75	A = 1.07782	B = .564405	Phi(1,n) = 199.704
Lat = 45	lon = 85	A = 1.07885	B = .564258	Phi(1,n) = 196.599
Lat = 45	lon = 95	A = 1.0166	B = .574259	Phi(1,n) = 204.296
Lat = 45	lon =105	A = 1.07875	B = .564272	Phi(1,n) = 176.138
Lat = 45	lon =115	A = 1.0584	B = .567293	Phi(1,n) = 174.614
Lat = 45	lon =125	A = 1.00844	B = .575753	Phi(1,n) = 168.802
Lat = 49	lon = 75	A = 1.06825	B = .565804	Phi(1,n) = 195.327
Lat = 49	lon = 85	A = 1.05965	B = .567101	Phi(1,n) = 186.148
Lat = 49	lon = 95	A = .948028	B = .588505	Phi(1,n) = 171.514
Lat = 49	lon =105	A = .941323	B = .590133	Phi(1,n) = 207.223
Lat = 49	lon =115	A = .969519	B = .583596	Phi(1,n) = 186.493
Lat = 49	lon =125	A = .934231	B = .591907	Phi(1,n) = 175.327

TABLE B39 OMEGA OPERATION IN RHO/RHO MODE IN CONUS FOR C, D, F AND H

Lat = 25	lon = 75	A = .877851	B = .608316	Phi(1,n) = 257.432
Lat = 25	lon = 85	A = .883876	B = .606341	Phi(1,n) = 267.88
Lat = 25	lon = 95	A = .880354	B = .607489	Phi(1,n) = 289.329
Lat = 25	lon =105	A = .895816	B = .602599	Phi(1,n) = 123.922
Lat = 25	lon =115	A = .930016	B = .59299	Phi(1,n) = 197.892
Lat = 25	lon =125	A = .98869	B = .579577	Phi(1,n) = 190.556
Lat = 30	lon = 75	A = .869845	B = .611035	Phi(1,n) = 252.512
Lat = 30	lon = 85	A = .866643	B = .612155	Phi(1,n) = 264.567
Lat = 30	lon = 95	A = .85702	B = .615633	Phi(1,n) = 205.201
Lat = 30	lon =105	A = .867289	B = .611927	Phi(1,n) = 123.748
Lat = 30	lon =115	A = .904777	B = .599929	Phi(1,n) = 196.04
Lat = 30	lon =125	A = .938303	B = .590882	Phi(1,n) = 189.765
Lat = 35	lon = 75	A = .864239	B = .613007	Phi(1,n) = 245.651
Lat = 35	lon = 85	A = .855959	B = .616027	Phi(1,n) = 256.886
Lat = 35	lon = 95	A = .837356	B = .623322	Phi(1,n) = 209.088
Lat = 35	lon =105	A = .843398	B = .620871	Phi(1,n) = 211
Lat = 35	lon =115	A = .88317	B = .60657	Phi(1,n) = 193.916
Lat = 35	lon =125	A = .887139	B = .605297	Phi(1,n) = 189.428
Lat = 40	lon = 75	A = .859214	B = .614824	Phi(1,n) = 236.978
Lat = 40	lon = 85	A = .854523	B = .616564	Phi(1,n) = 242.81
Lat = 40	lon = 95	A = .819501	B = .631072	Phi(1,n) = 204.663
Lat = 40	lon =105	A = .834605	B = .624465	Phi(1,n) = 202.449
Lat = 40	lon =115	A = .863797	B = .613165	Phi(1,n) = 193.919
Lat = 40	lon =125	A = .839842	B = .622304	Phi(1,n) = 191.379
Lat = 45	lon = 75	A = .84937	B = .618527	Phi(1,n) = 227.693
Lat = 45	lon = 85	A = .854975	B = .616395	Phi(1,n) = 224.149
Lat = 45	lon = 95	A = .834016	B = .624712	Phi(1,n) = 235.808
Lat = 45	lon =105	A = .850077	B = .618255	Phi(1,n) = 202.646
Lat = 45	lon =115	A = .830713	B = .626114	Phi(1,n) = 201.781
Lat = 45	lon =125	A = .796867	B = .642136	Phi(1,n) = 199.729
Lat = 49	lon = 75	A = .831016	B = .624713	Phi(1,n) = 221.593
Lat = 49	lon = 85	A = .834087	B = .624683	Phi(1,n) = 213.075
Lat = 49	lon = 95	A = .803441	B = .638765	Phi(1,n) = 209.684
Lat = 49	lon =105	A = .798232	B = .641425	Phi(1,n) = 246.241
Lat = 49	lon =115	A = .793401	B = .64397	Phi(1,n) = 221.304
Lat = 49	lon =125	A = .775195	B = .654293	Phi(1,n) = 126.612

TABLE B40 OMEGA OPERATION IN RHO/RHO MODE IN CONUS USING C, d, G AND H

Lat = 25	lon = 75	A = .968865	B = .583739	Phi(1,n) = 214.662
Lat = 25	lon = 85	A = .966872	B = .584176	Phi(1,n) = 217.176
Lat = 25	lon = 95	A = .923572	B = .594686	Phi(1,n) = 218.974
Lat = 25	lon =105	A = .910198	B = .598369	Phi(1,n) = 130.759
Lat = 25	lon =115	A = .991576	B = .578999	Phi(1,n) = 145.258
Lat = 25	lon =125	A = 1.08792	B = .562981	Phi(1,n) = 151.056
Lat = 30	lon = 75	A = 1.01695	B = .574196	Phi(1,n) = 211.786
Lat = 30	lon = 85	A = .994016	B = .578516	Phi(1,n) = 215.76
Lat = 30	lon = 95	A = .912991	B = .597581	Phi(1,n) = 221.351
Lat = 30	lon =105	A = .91941	B = .595807	Phi(1,n) = 141.44
Lat = 30	lon =115	A = 1.05162	B = .568351	Phi(1,n) = 151.506
Lat = 30	lon =125	A = 1.17168	B = .552867	Phi(1,n) = 154.973
Lat = 35	lon = 75	A = 1.08192	B = .563821	Phi(1,n) = 208.187
Lat = 35	lon = 85	A = 1.04058	B = .570129	Phi(1,n) = 212.526
Lat = 35	lon = 95	A = .904721	B = .599946	Phi(1,n) = 223.416
Lat = 35	lon =105	A = .954192	B = .58705	Phi(1,n) = 148.821
Lat = 35	lon =115	A = 1.1328	B = .557215	Phi(1,n) = 156.525
Lat = 35	lon =125	A = 1.2254	B = .547664	Phi(1,n) = 158.128
Lat = 40	lon = 75	A = 1.15668	B = .554482	Phi(1,n) = 203.477
Lat = 40	lon = 85	A = 1.1228	B = .558426	Phi(1,n) = 205.836
Lat = 40	lon = 95	A = .917185	B = .596416	Phi(1,n) = 222.254
Lat = 40	lon =105	A = 1.04441	B = .569504	Phi(1,n) = 156.212
Lat = 40	lon =115	A = 1.21337	B = .548757	Phi(1,n) = 162.846
Lat = 40	lon =125	A = 1.20949	B = .549119	Phi(1,n) = 162.129
Lat = 45	lon = 75	A = 1.20571	B = .549474	Phi(1,n) = 197.54
Lat = 45	lon = 85	A = 1.21646	B = .548473	Phi(1,n) = 194.129
Lat = 45	lon = 95	A = 1.12742	B = .557862	Phi(1,n) = 199.741
Lat = 45	lon =105	A = 1.22551	B = .547655	Phi(1,n) = 173.646
Lat = 45	lon =115	A = 1.19366	B = .550635	Phi(1,n) = 172.625
Lat = 45	lon =125	A = 1.11227	B = .559744	Phi(1,n) = 168.039
Lat = 49	lon = 75	A = 1.18911	B = .551085	Phi(1,n) = 192.444
Lat = 49	lon = 85	A = 1.18478	B = .55152	Phi(1,n) = 183.215
Lat = 49	lon = 95	A = 1.0248	B = .572804	Phi(1,n) = 162.855
Lat = 49	lon =105	A = 1.01986	B = .573674	Phi(1,n) = 199.261
Lat = 49	lon =115	A = 1.06168	B = .566791	Phi(1,n) = 183.326
Lat = 49	lon =125	A = 1.00416	B = .576556	Phi(1,n) = 174.617

TABLE B41 OMEGA OPERATION IN RHO/ RHO MODE IN CONUS USING C, F< G AND H

Lat = 25	lon = 75	A = .882148	B = .606902	Phi(1,n) = 224.51
Lat = 25	lon = 85	A = .935079	B = .591693	Phi(1,n) = 219.886
Lat = 25	lon = 95	A = .98822	B = .579672	Phi(1,n) = 215.175
Lat = 25	lon =105	A = 1.03637	B = .570828	Phi(1,n) = 210.61
Lat = 25	lon =115	A = 1.07402	B = .564955	Phi(1,n) = 206.301
Lat = 25	lon =125	A = 1.09494	B = .56202	Phi(1,n) = 202.28
Lat = 30	lon = 75	A = .887654	B = .605133	Phi(1,n) = 226.666
Lat = 30	lon = 85	A = .930782	B = .592792	Phi(1,n) = 221.716
Lat = 30	lon = 95	A = .971375	B = .583193	Phi(1,n) = 216.696
Lat = 30	lon =105	A = 1.00424	B = .576541	Phi(1,n) = 211.815
Lat = 30	lon =115	A = 1.02269	B = .573174	Phi(1,n) = 207.195
Lat = 30	lon =125	A = 1.01701	B = .574185	Phi(1,n) = 202.942
Lat = 35	lon = 75	A = .890728	B = .604167	Phi(1,n) = 229.685
Lat = 35	lon = 85	A = .922121	B = .595074	Phi(1,n) = 224.213
Lat = 35	lon = 95	A = .94893	B = .58829	Phi(1,n) = 218.808
Lat = 35	lon =105	A = .96568	B = .58444	Phi(1,n) = 213.64
Lat = 35	lon =115	A = .965135	B = .584561	Phi(1,n) = 208.873
Lat = 35	lon =125	A = .937462	B = .591092	Phi(1,n) = 204.842
Lat = 40	lon = 75	A = .888933	B = .604729	Phi(1,n) = 233.686
Lat = 40	lon = 85	A = .908295	B = .598912	Phi(1,n) = 227.5
Lat = 40	lon = 95	A = .921936	B = .595124	Phi(1,n) = 221.656
Lat = 40	lon =105	A = .924509	B = .594436	Phi(1,n) = 216.269
Lat = 40	lon =115	A = .90969	B = .598513	Phi(1,n) = 211.6
Lat = 40	lon =125	A = .870801	B = .610705	Phi(1,n) = 208.428
Lat = 45	lon = 75	A = .880437	B = .607461	Phi(1,n) = 238.714
Lat = 45	lon = 85	A = .88944	B = .60457	Phi(1,n) = 231.697
Lat = 45	lon = 95	A = .892261	B = .60369	Phi(1,n) = 225.416
Lat = 45	lon =105	A = .884456	B = .606155	Phi(1,n) = 219.94
Lat = 45	lon =115	A = .861659	B = .613934	Phi(1,n) = 215.71
Lat = 45	lon =125	A = .821238	B = .630282	Phi(1,n) = 214.226
Lat = 49	lon = 75	A = .868782	B = .611405	Phi(1,n) = 243.463
Lat = 49	lon = 85	A = .87159	B = .610433	Phi(1,n) = 235.794
Lat = 49	lon = 95	A = .868158	B = .611622	Phi(1,n) = 229.218
Lat = 49	lon =105	A = .855229	B = .6163	Phi(1,n) = 223.812
Lat = 49	lon =115	A = .830234	B = .626319	Phi(1,n) = 220.23
Lat = 49	lon =125	A = .793306	B = .64402	Phi(1,n) = 220.692

TABLE B42 OMEGA OPERATION IN RHO?RHO MODE IN CONUS FOR D, F, G AND H

Lat	lon	A	B	Phi(1,n)
Lat = 25	lon = 75	A = .943375	B = .589629	Phi(1,n) = 249.954
Lat = 25	lon = 85	A = 1.00317	B = .576744	Phi(1,n) = 253.37
Lat = 25	lon = 95	A = 1.02779	B = .572284	Phi(1,n) = 258.548
Lat = 25	lon =105	A = .92815	B = .593476	Phi(1,n) = 82.2799
Lat = 25	lon =115	A = .805407	B = .637783	Phi(1,n) = 86.9416
Lat = 25	lon =125	A = .743199	B = .675809	Phi(1,n) = 103.827
Lat = 30	lon = 75	A = .971079	B = .583257	Phi(1,n) = 238.287
Lat = 30	lon = 85	A = .990343	B = .579245	Phi(1,n) = 243.559
Lat = 30	lon = 95	A = 1.00314	B = .57675	Phi(1,n) = 256.438
Lat = 30	lon =105	A = .903361	B = .600343	Phi(1,n) = 84.006
Lat = 30	lon =115	A = .775457	B = .654136	Phi(1,n) = 92.7332
Lat = 30	lon =125	A = .740081	B = .678181	Phi(1,n) = 126.028
Lat = 35	lon = 75	A = 1.02468	B = .572825	Phi(1,n) = 232.742
Lat = 35	lon = 85	A = 1.04542	B = .569341	Phi(1,n) = 232.874
Lat = 35	lon = 95	A = .979266	B = .581513	Phi(1,n) = 251.43
Lat = 35	lon =105	A = .862963	B = .613464	Phi(1,n) = 87.0339
Lat = 35	lon =115	A = .743573	B = .675528	Phi(1,n) = 111.018
Lat = 35	lon =125	A = .765213	B = .660501	Phi(1,n) = 224.096
Lat = 40	lon = 75	A = 1.01963	B = .573715	Phi(1,n) = 232.462
Lat = 40	lon = 85	A = 1.13705	B = .556713	Phi(1,n) = 227.482
Lat = 40	lon = 95	A = .985231	B = .580279	Phi(1,n) = 238.972
Lat = 40	lon =105	A = .788908	B = .646406	Phi(1,n) = 95.8617
Lat = 40	lon =115	A = .763272	B = .661757	Phi(1,n) = 231.685
Lat = 40	lon =125	A = .84672	B = .619558	Phi(1,n) = 210.159
Lat = 45	lon = 75	A = .896409	B = .602418	Phi(1,n) = 238.05
Lat = 45	lon = 85	A = .971216	B = .583227	Phi(1,n) = 229.341
Lat = 45	lon = 95	A = 1.21766	B = .548363	Phi(1,n) = 221.704
Lat = 45	lon =105	A = .831092	B = .625951	Phi(1,n) = 223.988
Lat = 45	lon =115	A = .943581	B = .589579	Phi(1,n) = 211.855
Lat = 45	lon =125	A = 1.00055	B = .577244	Phi(1,n) = 204.83
Lat = 49	lon = 75	A = .781659	B = .650488	Phi(1,n) = 254.948
Lat = 49	lon = 85	A = .761538	B = .662894	Phi(1,n) = 255.357
Lat = 49	lon = 95	A = .788589	B = .646582	Phi(1,n) = 100.605
Lat = 49	lon =105	A = 1.31677	B = .54048	Phi(1,n) = 36.377
Lat = 49	lon =115	A = 1.21381	B = .548717	Phi(1,n) = 29.4575
Lat = 49	lon =125	A = 1.18329	B = .55167	Phi(1,n) = 203.341

TABLE B43 OMEGA OPERATION IN RHO/RHO MODE INCONUS FOR C, D, F, G AND H

Lat	lon	A	B	Phi(1,n)
Lat = 25	lon = 75	A = .769215	B = .549656	Phi(1,n) = 232.91
Lat = 25	lon = 85	A = .788173	B = .543105	Phi(1,n) = 242.373
Lat = 25	lon = 95	A = .796748	B = .540365	Phi(1,n) = 262.283
Lat = 25	lon =105	A = .814664	B = .535039	Phi(1,n) = 98.8828
Lat = 25	lon =115	A = .843407	B = .527472	Phi(1,n) = 176.552
Lat = 25	lon =125	A = .888019	B = .517649	Phi(1,n) = 173.234
Lat = 30	lon = 75	A = .782068	B = .545137	Phi(1,n) = 229.2
Lat = 30	lon = 85	A = .790565	B = .542328	Phi(1,n) = 239.774
Lat = 30	lon = 95	A = .790185	B = .54245	Phi(1,n) = 178.139
Lat = 30	lon =105	A = .804405	B = .538026	Phi(1,n) = 98.8835
Lat = 30	lon =115	A = .841259	B = .528	Phi(1,n) = 176.633
Lat = 30	lon =125	A = .8766	B = .519971	Phi(1,n) = 174.025
Lat = 35	lon = 75	A = .797706	B = .540067	Phi(1,n) = 224.568
Lat = 35	lon = 85	A = .796229	B = .540528	Phi(1,n) = 234.186
Lat = 35	lon = 95	A = .781279	B = .545405	Phi(1,n) = 182.311
Lat = 35	lon =105	A = .791336	B = .542079	Phi(1,n) = 186.515
Lat = 35	lon =115	A = .837155	B = .529025	Phi(1,n) = 176.811
Lat = 35	lon =125	A = .84899	B = .526125	Phi(1,n) = 174.894
Lat = 40	lon = 75	A = .812819	B = .535564	Phi(1,n) = 218.908
Lat = 40	lon = 85	A = .809771	B = .536443	Phi(1,n) = 223.996
Lat = 40	lon = 95	A = .767719	B = .550204	Phi(1,n) = 177.808
Lat = 40	lon =105	A = .79164	B = .541982	Phi(1,n) = 181.521
Lat = 40	lon =115	A = .83075	B = .530668	Phi(1,n) = 179.366
Lat = 40	lon =125	A = .811201	B = .536029	Phi(1,n) = 177.275
Lat = 45	lon = 75	A = .817902	B = .53413	Phi(1,n) = 212.712
Lat = 45	lon = 85	A = .823547	B = .53258	Phi(1,n) = 209.596
Lat = 45	lon = 95	A = .799405	B = .539543	Phi(1,n) = 218.748
Lat = 45	lon =105	A = .821426	B = .533157	Phi(1,n) = 189.136
Lat = 45	lon =115	A = .802572	B = .538577	Phi(1,n) = 187.986
Lat = 45	lon =125	A = .764409	B = .551434	Phi(1,n) = 183.189
Lat = 49	lon = 75	A = .806759	B = .537326	Phi(1,n) = 208.483
Lat = 49	lon = 85	A = .805891	B = .537583	Phi(1,n) = 199.515
Lat = 49	lon = 95	A = .759266	B = .553395	Phi(1,n) = 188.623
Lat = 49	lon =105	A = .751815	B = .556346	Phi(1,n) = 224.718
Lat = 49	lon =115	A = .753302	B = .555747	Phi(1,n) = 202.523
Lat = 49	lon =125	A = .723367	B = .568981	Phi(1,n) = 192.709

TABLE B44 STATIONS ACDEH

Lat = 55	lon =130	A = .785492	B = .49935	Phi(1,n) = 161.259
Lat = 55	lon =140	A = .802979	B = .491325	Phi(1,n) = 153.936
Lat = 55	lon =150	A = .821102	B = .481649	Phi(1,n) = 145.932
Lat = 55	lon =160	A = .878838	B = .466233	Phi(1,n) = 137.063
Lat = 55	lon =170	A = .87261	B = .463172	Phi(1,n) = 128.352
Lat = 60	lon =130	A = .82523	B = .479407	Phi(1,n) = 161.04
Lat = 60	lon =140	A = .836287	B = .475801	Phi(1,n) = 153.287
Lat = 60	lon =150	A = .815789	B = .471103	Phi(1,n) = 145.134
Lat = 60	lon =160	A = .884122	B = .461759	Phi(1,n) = 136.684
Lat = 60	lon =170	A = .88235	B = .459057	Phi(1,n) = 128.39
Lat = 65	lon =130	A = .863695	B = .466133	Phi(1,n) = 159.269
Lat = 65	lon =140	A = .868582	B = .46447	Phi(1,n) = 151.844
Lat = 65	lon =150	A = .868937	B = .462712	Phi(1,n) = 143.944
Lat = 65	lon =160	A = .886242	B = .45812	Phi(1,n) = 135.874
Lat = 65	lon =170	A = .88831	B = .455724	Phi(1,n) = 127.837
Lat = 70	lon =130	A = .894507	B = .457717	Phi(1,n) = 157.377
Lat = 70	lon =140	A = .895995	B = .456652	Phi(1,n) = 150.18
Lat = 70	lon =150	A = .88913	B = .456399	Phi(1,n) = 142.503
Lat = 70	lon =160	A = .88537	B = .455505	Phi(1,n) = 134.645
Lat = 70	lon =170	A = .891247	B = .453226	Phi(1,n) = 126.742

TABLE B45 STATIONS CDEH (STATION A IS OUT)

Lat = 55	lon =130	A = .807714	B = .665529	Phi(1,n) = 198.989
Lat = 55	lon =140	A = .82742	B = .655078	Phi(1,n) = 179.478
Lat = 55	lon =150	A = .833209	B = .648327	Phi(1,n) = 250.77
Lat = 55	lon =160	A = .959505	B = .600275	Phi(1,n) = 193.052
Lat = 55	lon =170	A = .897972	B = .613045	Phi(1,n) = 26.0393
Lat = 60	lon =130	A = .797133	B = .66376	Phi(1,n) = 287.663
Lat = 60	lon =140	A = .820482	B = .651491	Phi(1,n) = 269.63
Lat = 60	lon =150	A = .855373	B = .63419	Phi(1,n) = 252.178
Lat = 60	lon =160	A = .854284	B = .632036	Phi(1,n) = 41.884
Lat = 60	lon =170	A = .866285	B = .624677	Phi(1,n) = 30.249
Lat = 65	lon =130	A = 1.0914	B = .576552	Phi(1,n) = 115.775
Lat = 65	lon =140	A = 1.1096	B = .573421	Phi(1,n) = 101.79
Lat = 65	lon =150	A = 1.12143	B = .571114	Phi(1,n) = 88.5803
Lat = 65	lon =160	A = .827729	B = .643926	Phi(1,n) = 45.9834
Lat = 65	lon =170	A = .835386	B = .639051	Phi(1,n) = 34.4897
Lat = 70	lon =130	A = 1.07327	B = .581541	Phi(1,n) = 119.859
Lat = 70	lon =140	A = 1.08761	B = .57811	Phi(1,n) = 106.454
Lat = 70	lon =150	A = 1.09755	B = .575812	Phi(1,n) = 93.7068
Lat = 70	lon =160	A = 1.10275	B = .574436	Phi(1,n) = 81.6028
Lat = 70	lon =170	A = .808333	B = .655565	Phi(1,n) = 38.7611

TABLE B46 STATIONS ADEH (STATION C IS OUT)

Lat = 55	lon =130	A = 1.21097	B = .699069	Phi(1,n) = 89.2741
Lat = 55	lon =140	A = 1.0545	B = .735736	Phi(1,n) =-66.8053
Lat = 55	lon =150	A = 1.00283	B = .742387	Phi(1,n) =-75.7637
Lat = 55	lon =160	A = 1.11701	B = .692306	Phi(1,n) =-10.4478
Lat = 55	lon =170	A = 1.10414	B = .681562	Phi(1,n) =-13.221
Lat = 60	lon =130	A = 1.19631	B = .66292	Phi(1,n) = 96.5713
Lat = 60	lon =140	A = 1.01386	B = .710733	Phi(1,n) =-57.5731
Lat = 60	lon =150	A = 1.37938	B = .638728	Phi(1,n) = 85.2035
Lat = 60	lon =160	A = .915254	B = .738343	Phi(1,n) = 41.4692
Lat = 60	lon =170	A = .900629	B = .732581	Phi(1,n) = 39.3576
Lat = 65	lon =130	A = 1.1926	B = .637392	Phi(1,n) = 103.143
Lat = 65	lon =140	A = .983125	B = .690176	Phi(1,n) =-48.5294
Lat = 65	lon =150	A = 1.24718	B = .632977	Phi(1,n) = 89.8944
Lat = 65	lon =160	A = .880844	B = .729017	Phi(1,n) = 40.3589
Lat = 65	lon =170	A = .868278	B = .726316	Phi(1,n) = 37.7393
Lat = 70	lon =130	A = 1.1957	B = .6192	Phi(1,n) = 109.104
Lat = 70	lon =140	A = 1.15912	B = .627356	Phi(1,n) = 102.383
Lat = 70	lon =150	A = 1.14557	B = .629588	Phi(1,n) = 94.6043
Lat = 70	lon =160	A = 1.16928	B = .623345	Phi(1,n) = 86.8589
Lat = 70	lon =170	A = .8406	B = .720288	Phi(1,n) = 36.3095

TABLE B47 STATIONS ACEH (STATION D IS OUT)

Lat = 55	lon =130	A = 2.03971	B = .628043	Phi(1,n) = 135.98
Lat = 55	lon =140	A = 1.91757	B = .62023	Phi(1,n) = 130.887
Lat = 55	lon =150	A = 1.71861	B = .611421	Phi(1,n) = 124.444
Lat = 55	lon =160	A = 1.56467	B = .601481	Phi(1,n) = 117.586
Lat = 55	lon =170	A = 1.4542	B = .59292	Phi(1,n) = 110.752
Lat = 60	lon =130	A = 1.95192	B = .617359	Phi(1,n) = 135.391
Lat = 60	lon =140	A = 1.86264	B = .610527	Phi(1,n) = 129.959
Lat = 60	lon =150	A = 1.70103	B = .604437	Phi(1,n) = 123.566
Lat = 60	lon =160	A = 1.56977	B = .597555	Phi(1,n) = 117.021
Lat = 60	lon =170	A = 1.47052	B = .590961	Phi(1,n) = 110.525
Lat = 65	lon =130	A = 1.87665	B = .608508	Phi(1,n) = 135.291
Lat = 65	lon =140	A = 1.81585	B = .602453	Phi(1,n) = 129.534
Lat = 65	lon =150	A = 1.68574	B = .598014	Phi(1,n) = 123.006
Lat = 65	lon =160	A = 1.57477	B = .593077	Phi(1,n) = 116.443
Lat = 65	lon =170	A = 1.486	B = .588038	Phi(1,n) = 109.921
Lat = 70	lon =130	A = 1.80975	B = .600709	Phi(1,n) = 135.667
Lat = 70	lon =140	A = 1.77514	B = .595271	Phi(1,n) = 129.533
Lat = 70	lon =150	A = 1.67216	B = .591925	Phi(1,n) = 122.699
Lat = 70	lon =160	A = 1.58034	B = .588282	Phi(1,n) = 115.868
Lat = 70	lon =170	A = 1.50266	B = .584465	Phi(1,n) = 109.048

TABLE B48 STAIONS ACDH (STATION E IS OUT)

Lat = 55	lon =130	A = .921452	B = .604828	Phi(1,n) = 164.003
Lat = 55	lon =140	A = .929738	B = .599481	Phi(1,n) = 153.225
Lat = 55	lon =150	A = .949628	B = .592003	Phi(1,n) = 143.101
Lat = 55	lon =160	A = 1.02419	B = .576188	Phi(1,n) = 133.478
Lat = 55	lon =170	A = .994829	B = .583674	Phi(1,n) = 124.136
Lat = 60	lon =130	A = .966486	B = .587957	Phi(1,n) = 164.903
Lat = 60	lon =140	A = .961589	B = .587295	Phi(1,n) = 154.509
Lat = 60	lon =150	A = .969146	B = .584595	Phi(1,n) = 144.404
Lat = 60	lon =160	A = 1.01727	B = .575203	Phi(1,n) = 134.817
Lat = 60	lon =170	A = 1.00264	B = .57942	Phi(1,n) = 125.839
Lat = 65	lon =130	A = 1.00595	B = .578689	Phi(1,n) = 163.622
Lat = 65	lon =140	A = .992388	B = .579557	Phi(1,n) = 154.241
Lat = 65	lon =150	A = .988929	B = .579551	Phi(1,n) = 144.733
Lat = 65	lon =160	A = 1.00928	B = .575912	Phi(1,n) = 135.481
Lat = 65	lon =170	A = 1.00643	B = .577693	Phi(1,n) = 126.684
Lat = 70	lon =130	A = 1.03313	B = .574927	Phi(1,n) = 161.827
Lat = 70	lon =140	A = 1.01608	B = .576059	Phi(1,n) = 153.207
Lat = 70	lon =150	A = 1.0056	B = .57724	Phi(1,n) = 144.303
Lat = 70	lon =160	A = .999069	B = .578679	Phi(1,n) = 135.419
Lat = 70	lon =170	A = 1.0063	B = .578334	Phi(1,n) = 126.726

TABLE B49 STATIONS ACDE (STATION H IS OUT)

Lat = 55	lon =130	A = 1.09788	B = .591497	Phi(1,n) = 151.425
Lat = 55	lon =140	A = 1.11561	B = .584378	Phi(1,n) = 143.764
Lat = 55	lon =150	A = 1.11459	B = .58002	Phi(1,n) = 134.927
Lat = 55	lon =160	A = 1.12352	B = .576791	Phi(1,n) = 125.602
Lat = 55	lon =170	A = 1.13908	B = .575798	Phi(1,n) = 116.374
Lat = 60	lon =130	A = 1.14255	B = .574958	Phi(1,n) = 150.957
Lat = 60	lon =140	A = 1.16395	B = .571916	Phi(1,n) = 143.081
Lat = 60	lon =150	A = 1.16254	B = .570939	Phi(1,n) = 134.32
Lat = 60	lon =160	A = 1.16564	B = .570262	Phi(1,n) = 125.344
Lat = 60	lon =170	A = 1.17189	B = .570667	Phi(1,n) = 116.514
Lat = 65	lon =130	A = 1.19684	B = .562604	Phi(1,n) = 149.162
Lat = 65	lon =140	A = 1.21699	B = .561751	Phi(1,n) = 141.711
Lat = 65	lon =150	A = 1.21147	B = .562887	Phi(1,n) = 133.348
Lat = 65	lon =160	A = 1.20855	B = .563921	Phi(1,n) = 124.787
Lat = 65	lon =170	A = 1.2073	B = .56536	Phi(1,n) = 116.308
Lat = 70	lon =130	A = 1.25246	B = .553862	Phi(1,n) = 147.257
Lat = 70	lon =140	A = 1.27129	B = .553817	Phi(1,n) = 140.147
Lat = 70	lon =150	A = 1.26057	B = .555982	Phi(1,n) = 132.16
Lat = 70	lon =160	A = 1.25209	B = .557958	Phi(1,n) = 123.958
Lat = 70	lon =170	A = 1.24495	B = .56001	Phi(1,n) = 115.746

TABLE B50 STATIONS DEH (STATIONS A AND C ARE OUT)

Lat = 55	lon =130	A = 1.9166	B = .79957	Phi(1,n) = 62.6794
Lat = 55	lon =140	A = 2.26577	B = .783502	Phi(1,n) = 45.9752
Lat = 55	lon =150	A = 2.69599	B = .768131	Phi(1,n) = 32.1233
Lat = 55	lon =160	A = 3.26425	B = .754471	Phi(1,n) = 3.21705
Lat = 55	lon =170	A = 3.61058	B = .746105	Phi(1,n) =-4.33281
Lat = 60	lon =130	A = 1.83128	B = .774733	Phi(1,n) = 70.2375
Lat = 60	lon =140	A = 2.04327	B = .768068	Phi(1,n) = 54.0413
Lat = 60	lon =150	A = 2.28492	B = .759457	Phi(1,n) = 40.1481
Lat = 60	lon =160	A = 2.57636	B = .749872	Phi(1,n) = 5.82247
Lat = 60	lon =170	A = 2.73208	B = .743854	Phi(1,n) =-2.55983
Lat = 65	lon =130	A = 1.7758	B = .760062	Phi(1,n) = 76.6976
Lat = 65	lon =140	A = 1.89908	B = .757559	Phi(1,n) = 61.4263
Lat = 65	lon =150	A = 2.03252	B = .753246	Phi(1,n) = 47.829
Lat = 65	lon =160	A = 2.15133	B = .748607	Phi(1,n) = 8.60416
Lat = 65	lon =170	A = 2.22543	B = .744688	Phi(1,n) =-.528979
Lat = 70	lon =130	A = 1.73791	B = .752321	Phi(1,n) = 82.079
Lat = 70	lon =140	A = 1.80432	B = .751377	Phi(1,n) = 67.998
Lat = 70	lon =150	A = 1.87341	B = .749452	Phi(1,n) = 55.0077
Lat = 70	lon =160	A = 1.93247	B = .747143	Phi(1,n) = 43.1484
Lat = 70	lon =170	A = 1.90319	B = .748792	Phi(1,n) = 1.88094

TABLE B51 STATIONSCEH (STATIONS A AND D ARE OUT)

Lat = 55	lon =130	A = 3.24961	B = .881692	Phi(1,n) = 119.213
Lat = 55	lon =140	A = 3.55368	B = .879565	Phi(1,n) = 102.618
Lat = 55	lon =150	A = 3.87379	B = .861145	Phi(1,n) = 85.937
Lat = 55	lon =160	A = 4.16655	B = .833666	Phi(1,n) = 69.9484
Lat = 55	lon =170	A = 4.36489	B = .807175	Phi(1,n) = 55.3211
Lat = 60	lon =130	A = 3.04014	B = .863946	Phi(1,n) = 118.564
Lat = 60	lon =140	A = 3.21073	B = .861758	Phi(1,n) = 103.609
Lat = 60	lon =150	A = 3.37193	B = .850682	Phi(1,n) = 88.5968
Lat = 60	lon =160	A = 3.4964	B = .834035	Phi(1,n) = 74.0766
Lat = 60	lon =170	A = 3.55151	B = .816875	Phi(1,n) = 60.5279
Lat = 65	lon =130	A = 2.88283	B = .851419	Phi(1,n) = 118.083
Lat = 65	lon =140	A = 2.97656	B = .849788	Phi(1,n) = 104.489
Lat = 65	lon =150	A = 3.05571	B = .843414	Phi(1,n) = 90.8767
Lat = 65	lon =160	A = 3.10535	B = .833831	Phi(1,n) = 77.6076
Lat = 65	lon =170	A = 3.11072	B = .82349	Phi(1,n) = 65.0049
Lat = 70	lon =130	A = 2.7618	B = .842395	Phi(1,n) = 117.741
Lat = 70	lon =140	A = 2.81024	B = .841413	Phi(1,n) = 105.258
Lat = 70	lon =150	A = 2.84604	B = .838018	Phi(1,n) = 92.7863
Lat = 70	lon =160	A = 2.862	B = .832902	Phi(1,n) = 80.5454
Lat = 70	lon =170	A = 2.85221	B = .827168	Phi(1,n) = 68.7341

TABLE B52 STAIONS CDH (STATIONS A AND E ARE OUT)

Lat = 55	lon =130	A = 1.36719	B = .794251	Phi(1,n) = 135.901
Lat = 55	lon =140	A = 1.28015	B = .808827	Phi(1,n) = 119.371
Lat = 55	lon =150	A = 1.21641	B = .824213	Phi(1,n) = 189.11
Lat = 55	lon =160	A = 1.43105	B = .776468	Phi(1,n) = 175.333
Lat = 55	lon =170	A = 1.19048	B = .836199	Phi(1,n) = 77.7242
Lat = 60	lon =130	A = 1.42501	B = .804508	Phi(1,n) = 134.005
Lat = 60	lon =140	A = 1.35079	B = .811107	Phi(1,n) = 207.625
Lat = 60	lon =150	A = 1.30582	B = .817885	Phi(1,n) = 189.638
Lat = 60	lon =160	A = 1.29512	B = .820244	Phi(1,n) = 88.0162
Lat = 60	lon =170	A = 1.2929	B = .823404	Phi(1,n) = 76.5057
Lat = 65	lon =130	A = 1.53271	B = .814744	Phi(1,n) = 133.288
Lat = 65	lon =140	A = 1.4626	B = .814894	Phi(1,n) = 117.821
Lat = 65	lon =150	A = 1.42431	B = .81625	Phi(1,n) = 101.906
Lat = 65	lon =160	A = 1.41464	B = .816593	Phi(1,n) = 178.187
Lat = 65	lon =170	A = 1.42142	B = .817179	Phi(1,n) = 166.988
Lat = 70	lon =130	A = 1.6744	B = .826015	Phi(1,n) = 133.629
Lat = 70	lon =140	A = 1.60788	B = .82234	Phi(1,n) = 119.371
Lat = 70	lon =150	A = 1.42127	B = .846634	Phi(1,n) = 195.771
Lat = 70	lon =160	A = 1.41902	B = .844285	Phi(1,n) = 184.206
Lat = 70	lon =170	A = 1.57578	B = .81844	Phi(1,n) = 168.386

TABLE B53 STATIONS CDE (STATIONS A AND H ARE OUT)

Lat = 55	lon =130	A = 1.00232	B = .895161	Phi(1,n) = 197.104
Lat = 55	lon =140	A = .974906	B = .914613	Phi(1,n) = 203.875
Lat = 55	lon =150	A = 1.00117	B = .895877	Phi(1,n) = 130.467
Lat = 55	lon =160	A = 1.0686	B = .859679	Phi(1,n) = 124.046
Lat = 55	lon =170	A = 1.49455	B = .754188	Phi(1,n) = 58.4897
Lat = 60	lon =130	A = 1.02594	B = .881396	Phi(1,n) = 240.194
Lat = 60	lon =140	A = 1.03187	B = .877882	Phi(1,n) = 233.302
Lat = 60	lon =150	A = 1.06381	B = .861923	Phi(1,n) = 226.414
Lat = 60	lon =160	A = 1.5197	B = .748861	Phi(1,n) = 72.5957
Lat = 60	lon =170	A = 1.47912	B = .757885	Phi(1,n) = 62.3919
Lat = 65	lon =130	A = 1.52862	B = .747927	Phi(1,n) = 111.597
Lat = 65	lon =140	A = 1.52607	B = .748109	Phi(1,n) = 99.1315
Lat = 65	lon =150	A = 1.50937	B = .751249	Phi(1,n) = 87.636
Lat = 65	lon =160	A = 1.48496	B = .756512	Phi(1,n) = 76.7772
Lat = 65	lon =170	A = 1.45709	B = .763243	Phi(1,n) = 66.4164
Lat = 70	lon =130	A = 1.46022	B = .762365	Phi(1,n) = 116.185
Lat = 70	lon =140	A = 1.4652	B = .761144	Phi(1,n) = 103.762
Lat = 70	lon =150	A = 1.45978	B = .762442	Phi(1,n) = 92.1082
Lat = 70	lon =160	A = 1.44718	B = .76562	Phi(1,n) = 81.0712
Lat = 70	lon =170	A = 1.43028	B = .770122	Phi(1,n) = 70.5449

TABLE B54 STATIONS AEH (STATIONS C AND D ARE OUT)

Lat = 55	lon =130	A = 7.37518	B = 1.26845	Phi(1,n) =-24.2171
Lat = 55	lon =140	A = 6.00295	B = 1.26089	Phi(1,n) = 196.144
Lat = 55	lon =150	A = 5.73971	B = 1.22562	Phi(1,n) = 181.219
Lat = 55	lon =160	A = 5.86465	B = 1.17812	Phi(1,n) = 168.725
Lat = 55	lon =170	A = 6.00018	B = 1.12911	Phi(1,n) = 158.578
Lat = 60	lon =130	A = 6.99568	B = 1.22509	Phi(1,n) =-24.7867
Lat = 60	lon =140	A = 5.68655	B = 1.21538	Phi(1,n) = 200.962
Lat = 60	lon =150	A = 5.16744	B = 1.18765	Phi(1,n) = 187.498
Lat = 60	lon =160	A = 4.95041	B = 1.14843	Phi(1,n) = 175.54
Lat = 60	lon =170	A = 4.78714	B = 1.10437	Phi(1,n) = 165.352
Lat = 65	lon =130	A = 6.51367	B = 1.18022	Phi(1,n) =-25.3162
Lat = 65	lon =140	A = 5.37809	B = 1.16816	Phi(1,n) = 205.289
Lat = 65	lon =150	A = 4.77946	B = 1.14483	Phi(1,n) = 193.165
Lat = 65	lon =160	A = 4.41796	B = 1.11271	Phi(1,n) = 181.952
Lat = 65	lon =170	A = 4.1354	B = 1.07526	Phi(1,n) = 171.974
Lat = 70	lon =130	A = 5.95059	B = 1.13411	Phi(1,n) =-25.7715
Lat = 70	lon =140	A = 5.04631	B = 1.12092	Phi(1,n) = 209.34
Lat = 70	lon =150	A = 4.47521	B = 1.10089	Phi(1,n) = 198.309
Lat = 70	lon =160	A = 4.07675	B = 1.0749	Phi(1,n) = 187.834
Lat = 70	lon =170	A = 3.75891	B = 1.04464	Phi(1,n) = 178.166

TABLE B55 STATIONS ADH (STATIONS C AND E A REOUT)

Lat = 55	lon =130	A = 1.45587	B = .86209	Phi(1,n) = 4.76217
Lat = 55	lon =140	A = 1.44052	B = .874653	Phi(1,n) = .924931
Lat = 55	lon =150	A = 1.74879	B = .828861	Phi(1,n) = 86.8665
Lat = 55	lon =160	A = 1.43227	B = .876198	Phi(1,n) = 90.0878
Lat = 55	lon =170	A = 1.42128	B = .87177	Phi(1,n) = 84.179
Lat = 60	lon =130	A = 1.43743	B = .823604	Phi(1,n) = 12.2449
Lat = 60	lon =140	A = 1.42375	B = .837406	Phi(1,n) = 7.6179
Lat = 60	lon =150	A = 1.55787	B = .819196	Phi(1,n) = 92.5959
Lat = 60	lon =160	A = 1.41674	B = .844203	Phi(1,n) = 90.7476
Lat = 60	lon =170	A = 1.41043	B = .841753	Phi(1,n) = 84.1874
Lat = 65	lon =130	A = 1.429	B = .798172	Phi(1,n) = 109.07
Lat = 65	lon =140	A = 1.41698	B = .80917	Phi(1,n) = 103.897
Lat = 65	lon =150	A = 1.40551	B = .816531	Phi(1,n) = 9.07884
Lat = 65	lon =160	A = 1.41218	B = .816711	Phi(1,n) = 1.47747
Lat = 65	lon =170	A = 1.40741	B = .815796	Phi(1,n) =-5.69973
Lat = 70	lon =130	A = 1.42674	B = .781644	Phi(1,n) = 115.376
Lat = 70	lon =140	A = 1.41786	B = .788661	Phi(1,n) = 109.722
Lat = 70	lon =150	A = 1.41882	B = .792272	Phi(1,n) = 104.693
Lat = 70	lon =160	A = 1.28917	B = .821498	Phi(1,n) = 8.17361
Lat = 70	lon =170	A = 1.41548	B = .793881	Phi(1,n) =-5.49169

TABLE B56 STATIONS ADE (STATIONS C AND H ARE OUT)

Lat = 55	lon =130	A = 5.04204	B = .94349	Phi(1,n) = 67.8695
Lat = 55	lon =140	A = 2.93907	B = .95002	Phi(1,n) = 61.9719
Lat = 55	lon =150	A = 2.27573	B = .947695	Phi(1,n) = 59.6237
Lat = 55	lon =160	A = 1.93046	B = .946078	Phi(1,n) = 57.9826
Lat = 55	lon =170	A = 1.73561	B = .944915	Phi(1,n) =-33.2909
Lat = 60	lon =130	A = 4.61142	B = .879683	Phi(1,n) = 73.8984
Lat = 60	lon =140	A = 2.98945	B = .901231	Phi(1,n) = 66.6522
Lat = 60	lon =150	A = 2.3872	B = .911334	Phi(1,n) = 62.5809
Lat = 60	lon =160	A = 2.03945	B = .918098	Phi(1,n) = 59.3347
Lat = 60	lon =170	A = 1.82624	B = .923055	Phi(1,n) = 56.6367
Lat = 65	lon =130	A = 4.2445	B = .837847	Phi(1,n) = 79.5063
Lat = 65	lon =140	A = 2.99147	B = .862685	Phi(1,n) = 71.3506
Lat = 65	lon =150	A = 2.46704	B = .87846	Phi(1,n) = 65.9356
Lat = 65	lon =160	A = 2.13547	B = .89032	Phi(1,n) = 61.3234
Lat = 65	lon =170	A = 1.91641	B = .899537	Phi(1,n) = 57.3063
Lat = 70	lon =130	A = 3.90806	B = .811606	Phi(1,n) = 84.6504
Lat = 70	lon =140	A = 2.95145	B = .834313	Phi(1,n) = 75.9016
Lat = 70	lon =150	A = 2.51584	B = .850821	Phi(1,n) = 69.4724
Lat = 70	lon =160	A = 2.21642	B = .864461	Phi(1,n) = 63.7116
Lat = 70	lon =170	A = 2.00439	B = .875735	Phi(1,n) = 58.4895

TABLE B57 STATIONS ACH (STATIONS D AND E ARE OUT)

Lat = 55	lon =130	A = 2.32674	B = .806297	Phi(1,n) = 136.918
Lat = 55	lon =140	A = 2.11818	B = .787182	Phi(1,n) = 129.455
Lat = 55	lon =150	A = 1.92705	B = .770751	Phi(1,n) = 121.597
Lat = 55	lon =160	A = 1.76805	B = .759013	Phi(1,n) = 113.693
Lat = 55	lon =170	A = 1.64799	B = .752731	Phi(1,n) = 106.246
Lat = 60	lon =130	A = 2.2172	B = .796024	Phi(1,n) = 136.517
Lat = 60	lon =140	A = 2.04864	B = .781205	Phi(1,n) = 129.176
Lat = 60	lon =150	A = 1.89491	B = .768757	Phi(1,n) = 121.673
Lat = 60	lon =160	A = 1.76407	B = .759601	Phi(1,n) = 114.217
Lat = 60	lon =170	A = 1.66035	B = .75398	Phi(1,n) = 107.184
Lat = 65	lon =130	A = 2.12716	B = .787647	Phi(1,n) = 136.559
Lat = 65	lon =140	A = 1.99294	B = .776358	Phi(1,n) = 129.227
Lat = 65	lon =150	A = 1.87017	B = .766915	Phi(1,n) = 121.851
Lat = 65	lon =160	A = 1.76348	B = .75973	Phi(1,n) = 114.572
Lat = 65	lon =170	A = 1.67561	B = .754866	Phi(1,n) = 107.531
Lat = 70	lon =130	A = 2.05047	B = .780387	Phi(1,n) = 137.031
Lat = 70	lon =140	A = 1.94684	B = .772044	Phi(1,n) = 129.555
Lat = 70	lon =150	A = 1.85123	B = .764986	Phi(1,n) = 122.085
Lat = 70	lon =160	A = 1.76643	B = .759405	Phi(1,n) = 114.685
Lat = 70	lon =170	A = 1.6943	B = .755331	Phi(1,n) = 107.402

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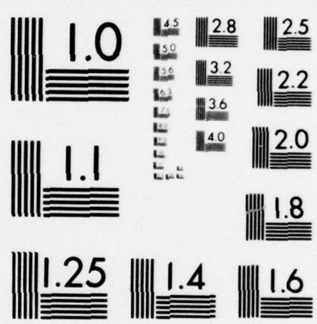

MICROCOPY RESOLUTION TEST CHART
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TABLE B58 STATIONS ACE (STATIONS D AND H ARE OUT)

Lat = 55	lon =130	A = 3.90937	B = .75768	Phi(1,n) = 125.36
Lat = 55	lon =140	A = 2.98001	B = .752678	Phi(1,n) = 120.641
Lat = 55	lon =150	A = 2.39924	B = .747532	Phi(1,n) = 113.642
Lat = 55	lon =160	A = 2.06267	B = .743621	Phi(1,n) = 106.015
Lat = 55	lon =170	A = 1.85049	B = .743266	Phi(1,n) = 98.3939
Lat = 60	lon =130	A = 3.82739	B = .747863	Phi(1,n) = 124.225
Lat = 60	lon =140	A = 3.03662	B = .74426	Phi(1,n) = 119.171
Lat = 60	lon =150	A = 2.48568	B = .741895	Phi(1,n) = 112.267
Lat = 60	lon =160	A = 2.15138	B = .740473	Phi(1,n) = 105.065
Lat = 60	lon =170	A = 1.93309	B = .741083	Phi(1,n) = 97.859
Lat = 65	lon =130	A = 3.68641	B = .740964	Phi(1,n) = 123.671
Lat = 65	lon =140	A = 3.05904	B = .738377	Phi(1,n) = 118.249
Lat = 65	lon =150	A = 2.55927	B = .73764	Phi(1,n) = 111.373
Lat = 65	lon =160	A = 2.23732	B = .737665	Phi(1,n) = 104.322
Lat = 65	lon =170	A = 2.01783	B = .73891	Phi(1,n) = 97.281
Lat = 70	lon =130	A = 3.49116	B = .736178	Phi(1,n) = 123.701
Lat = 70	lon =110	A = 3.03954	B = .734257	Phi(1,n) = 117.965
Lat = 70	lon =150	A = 2.61154	B = .734467	Phi(1,n) = 110.913
Lat = 70	lon =160	A = 2.31599	B = .735268	Phi(1,n) = 103.792
Lat = 70	lon 170	A = 2.10395	B = .736824	Phi(1,n) = 96.6929

TABLE B59 STATIONS ACD (STATIONS E AND H ARE OUT)

Lat = 55	lon =130	A = 1.6078	B = .750489	Phi(1,n) = 147.582
Lat = 55	lon =140	A = 1.70283	B = .751756	Phi(1,n) = 135.159
Lat = 55	lon =150	A = 1.82616	B = .757765	Phi(1,n) = 122.451
Lat = 55	lon =160	A = 1.98618	B = .770439	Phi(1,n) = 109.584
Lat = 55	lon =170	A = 2.18386	B = .789524	Phi(1,n) = 97.094
Lat = 60	lon =130	A = 1.6183	B = .75218	Phi(1,n) = 147.047
Lat = 60	lon =140	A = 1.70424	B = .755295	Phi(1,n) = 135.028
Lat = 60	lon =150	A = 1.81649	B = .761522	Phi(1,n) = 122.816
Lat = 60	lon =160	A = 1.95653	B = .771985	Phi(1,n) = 110.668
Lat = 60	lon =170	A = 2.12326	B = .786678	Phi(1,n) = 98.897
Lat = 65	lon =130	A = 1.65655	B = .753811	Phi(1,n) = 144.961
Lat = 65	lon =140	A = 1.73016	B = .757763	Phi(1,n) = 134.001
Lat = 65	lon =150	A = 1.82667	B = .763871	Phi(1,n) = 122.646
Lat = 65	lon =160	A = 1.94514	B = .772663	Phi(1,n) = 111.278
Lat = 65	lon =170	A = 2.08351	B = .784204	Phi(1,n) = 100.165
Lat = 70	lon =130	A = 1.71716	B = .75482	Phi(1,n) = 142.368
Lat = 70	lon =140	A = 1.77688	B = .759163	Phi(1,n) = 132.394
Lat = 70	lon =150	A = 1.85571	B = .764941	Phi(1,n) = 121.955
Lat = 70	lon =160	A = 1.95177	B = .772389	Phi(1,n) = 111.376
Lat = 70	lon =170	A = 2.06286	B = .781551	Phi(1,n) = 100.887

TABLE B60 . STATIONS ACDEGH

Lat = 55	lon =130	A = .695465	B = .400983	Phi(1,n) = 153.195
Lat = 55	lon =140	A = .712582	B = .396716	Phi(1,n) = 146.696
Lat = 55	lon =150	A = .724849	B = .391924	Phi(1,n) = 139.707
Lat = 55	lon =160	A = .759213	B = .383652	Phi(1,n) = 132.331
Lat = 55	lon =170	A = .749335	B = .381839	Phi(1,n) = 124.569
Lat = 60	lon =130	A = .705052	B = .395966	Phi(1,n) = 154.813
Lat = 60	lon =140	A = .72015	B = .392384	Phi(1,n) = 147.637
Lat = 60	lon =150	A = .72991	B = .388997	Phi(1,n) = 140.2
Lat = 60	lon =160	A = .754397	B = .383256	Phi(1,n) = 132.712
Lat = 60	lon =170	A = .751799	B = .381327	Phi(1,n) = 125.113
Lat = 65	lon =130	A = .64108	B = .408321	Phi(1,n) = 152.633
Lat = 65	lon =140	A = .731208	B = .389121	Phi(1,n) = 147.818
Lat = 65	lon =150	A = .734229	B = .387142	Phi(1,n) = 140.288
Lat = 65	lon =160	A = .74765	B = .383544	Phi(1,n) = 132.764
Lat = 65	lon =170	A = .750381	B = .381471	Phi(1,n) = 125.217
Lat = 70	lon =130	A = .672711	B = .400629	Phi(1,n) = 153.22
Lat = 70	lon =140	A = .746564	B = .386395	Phi(1,n) = 147.633
Lat = 70	lon =150	A = .743915	B = .385334	Phi(1,n) = 140.092
Lat = 70	lon =160	A = .742901	B = .384063	Phi(1,n) = 132.473
Lat = 70	lon =170	A = .747403	B = .382099	Phi(1,n) = 124.878

TABLE B61 STATIONS ABCDEGH

Lat = 55	lon =130	A = .441842	B = .392168	Phi(1,n) =-52.3755
Lat = 55	lon =140	A = .447294	B = .387456	Phi(1,n) =-34.2156
Lat = 55	lon =150	A = .433731	B = .39477	Phi(1,n) =-43.5078
Lat = 55	lon =160	A = .463304	B = .373967	Phi(1,n) =-31.5102
Lat = 55	lon =170	A = .456213	B = .376248	Phi(1,n) =-34.2624
Lat = 60	lon =130	A = .433513	B = .393592	Phi(1,n) = 142.743
Lat = 60	lon =140	A = .436256	B = .391321	Phi(1,n) =-31.9178
Lat = 60	lon =150	A = .429706	B = .395087	Phi(1,n) =-37.8899
Lat = 60	lon =160	A = .463308	B = .372366	Phi(1,n) =-30.6902
Lat = 60	lon =170	A = .458574	B = .373654	Phi(1,n) =-35.2493
Lat = 65	lon =130	A = .442825	B = .384285	Phi(1,n) = 64.7049
Lat = 65	lon =140	A = .428289	B = .394513	Phi(1,n) =-31.629
Lat = 65	lon =150	A = .424269	B = .397055	Phi(1,n) =-37.5979
Lat = 65	lon =160	A = .456382	B = .374517	Phi(1,n) =-30.9289
Lat = 65	lon =170	A = .456663	B = .373412	Phi(1,n) =-36.5969
Lat = 70	lon =130	A = .441808	B = .383332	Phi(1,n) = 64.2373
Lat = 70	lon =140	A = .423323	B = .396538	Phi(1,n) =-34.9367
Lat = 70	lon =150	A = .420503	B = .398332	Phi(1,n) =-41.2431
Lat = 70	lon =160	A = .426401	B = .392778	Phi(1,n) =-37.4599
Lat = 70	lon =170	A = .450379	B = .375809	Phi(1,n) =-38.6677

APPENDIX C

DIFFERENTIAL OMEGA CONFIGURATION TRADE-OFF ANALYSIS

C.1 INTRODUCTION

Several different schemes are available for the implementation of the Differential Omega concept. The differences are primarily in the form of the data link from the ground monitor station to the airborne receiver. The data link elements include the content and format of the correction data to be transmitted to the aircraft, and the uplink transmission frequency (UHF, VHF, LF, for example). The alternatives available for these data link elements are discussed in more detail in the following.

C.2 DATA MESSAGE CONTENT AND FORMAT

The content and format of the differential Omega corrections have not been established. This section discusses those factors which bear on the content and format of the differential Omega uplink message. For each of these factors, several options are available for suitable specification of the differential Omega correction messages. These factors include phase correction reference, phase correction range and resolution, interval between uplink messages, and use of predicted propagation corrections (PPC's).

C.2.1 Phase Correction Reference

Uplinking of LOP corrections requires coordination of LOP selection between the ground and the air. Two choices of uplinking exist: either transmit all possible LOP's; or require the user equipment to determine appropriate LOP corrections from

those corrections transmitted. Neither of these choices is attractive due to the excessive data to be transmitted for the former or excessive requirements on user equipment for the latter.

Uplinking of individual Omega station phase corrections, which are referenced to a clock synchronized to the Omega system, is the most desirable option. This option services all Omega users, regardless of station selection or operating mode, and requires only a simple subtraction for generating LOP corrections. This method also allows rho/rho users to synchronize their clocks to the Omega network.

Differential Omega using individual station phase corrections referenced to an unsynchronized local time standard allows a simpler ground system to be used because an atomic time standard is not required. This approach would be satisfactory for LOP mode users but could cause a loss of potential accuracy to rho/rho mode users.

C.2.2 Phase Correction Range and Resolution

The range (maximum value) and resolution of the differential Omega corrections specify the length and data rate requirement of the differential uplink message. Due to the increasing capabilities and decreasing cost of digital hardware, it is assumed for this study that the differential Omega uplink will be digital. In order to correct for all propagation anomalies, the differential correction messages must be able to attain sufficiently large values (positive and negative). Allowing for ± 1 cycle of correction for predictable anomalies, and ± 1 cycle for unpredictable anomalies, a range of ± 2 cycles is required. This value is used as a nominal value for the study, but proper selection of the range of differential Omega corrections will require an examination of maximum observed deviations.

If the resolution of the phase correction is 6 bits (1/64 cycle), the entire phase correction can be incorporated into one 8 bit word, a length compatible with many microprocessors. Extending the resolution to 8 bits (1/256 cycle) allows the differential uplink error to be smaller than the instrumentation error. (Omega receivers typically measure phase to only 0.5 or 1 centicycle [13]). Reasonable choices for the phase correction message, therefore, are word lengths of 8 or 10 bits.

A potential problem with the differential Omega concept is uplinking a correction when the ground station cannot receive sufficiently strong signals to make a phase measurement. This could cause the aircraft receiver to make navigational errors. To avoid this, either the largest or smallest phase correction value can be assigned an implicit meaning that the differential correction is invalid or erroneous, and is not to be used. This provides a convenient feature at little cost in data rate.

C.2.3 Selection of Omega Stations and Frequencies to be Corrected

The number of Omega stations (or LOP's) and frequencies for which differential Omega corrections are to be provided must be determined. Two options are available: (1) uplink information for all Omega stations in a predefined pattern, or (2) identify uplink corrections for only certain Omega stations. Uplinking information for selected Omega stations or LOP's requires that the stations (or LOP's) be identified by additional data bits. Depending upon the uplink message length and uplink interval, the data rate may have to be increased to transmit the additional information. This could degrade the potential data rate savings achievable through transmitting only some phase corrections.

The selection of Omega frequencies for which differential Omega corrections are to be transmitted must also be specified. Since almost all Omega receivers use 10.2 kHz, differential corrections for 10.2 kHz Omega signals will certainly be included in any differential Omega scheme. Probably the next most important Omega frequency is 13.6 kHz, so a second alternative is to uplink phase corrections for both the 10.2 kHz and 13.6 kHz Omega signals. Other opt[illegible] include uplink of four Omega frequencies, various difference frequencies, and assortments of Omega and difference frequencies. The cost of uplinking more differential corrections could conceivably be the requirement for a higher data rate. The potential advantage of uplinking differential corrections at more frequencies are the same as those of multifrequency Omega: ability to perform lane resolution, ability to use whatever Omega signals are available, and possibly better accuracy because more measurements are utilized in the position solution.

Differential Omega can be made to work with any of the above approaches. However, a recommended method is to transmit corrections for all stations at all four frequencies. This provides the greatest amount of correction information in the differential Omega uplink, and allows for one standard format to be used.

C.2.4 Data Uplink Interval

The choice of interval between differential uplinks is a trade-off between accuracy and the required data rate to transmit all of the information, that the uplink medium must be able to support. The more often that differential corrections are sent, the greater the required data rate. However, the less frequently the differential uplinks are sent, the greater possibility exists that the Omega Phase characteristics can change before being corrected. Differential corrections need not be sent more frequently than every 10 seconds, which is the

commutation period of the Omega transmission protocol. Differential corrections should be sent at least every five minutes, so that the effects of the quickly changing Omega propagation phenomena are minimized [14]. The range of reasonable uplink intervals is 10 seconds to 5 minutes.

C.2.5 Predicted Propagation Corrections

Differential Omega involves the uplinking of differences between measured phase values and nominal phase values. Nominal phase values can be either charted LOP's, which are time invariant, or nominal phase values varying with time of day and day of year. These time varying nominal phase values are usually generated by Predicted Propagation Correction (PPC) programs. If differential Omega uplinks are referenced to charted LOP's, rather than PPC outputs, less sophisticated airborne receivers will be able to use differential Omega in place of PPC programs. If differential Omega uplinks are referenced to PPC's, however, less sophisticated Omega receivers (without PPC's) will be denied the benefits of differential uplinks. Therefore, PPC's should not be used in differential Omega.

C.2.6 Required Uplink Data Rate

The data rate required for transmission of differential corrections depends upon the length of the individual message and the time intervals between these messages. For a differential station transmitting differential uplinks for eight Omega stations with ten bits of message per station, at a rate of one message every five minutes, the required data rate is about 1/4 bits/second, exclusive of timing, framing, parity, and station identification bits. For differential corrections at 4 Omega frequencies for all 8 stations, uplinked every 10 seconds, the data rate for the message itself is 32 bits/second. This easily

achievable data rate allows a maximum amount of information to be uplinked, and is recommended.

C.3 DIFFERENTIAL OMEGA UPLINK MEDIA

There are many choices for the uplink medium for differential Omega corrections. Table C.1 shows these choices [15], which can be broken down into three general classes: satellite relay of differential Omega corrections, ground-based line of sight propagation (VHF-UHF) transmitters, and ground-based non-line of sight (HF-LF-VLF) transmitters.

The tradeoff in differential Omega implementation is total message content versus required bandwidth. As more complete messages are sent more frequently from more differential Omega stations, the required system bandwidth increases. This requirement for increased system bandwidth can be met by using more channels of fixed bandwidth, or higher bandwidth channels at higher frequencies. User equipment costs, ground equipment installation (or modification) costs, and system operating costs all must be determined for various bandwidth requirements in order to make a justifiable choice of uplink medium.

C.3.1 Satellite Uplink

Satellite relay of differential Omega corrections is one method for differential Omega operation. For this form of differential Omega, a satellite(s) in an appropriate orbit is required. The satellite transmitter should accommodate low-cost receivers to provide for user acceptance of the differential Omega system. A network of ground stations is required to gather differential Omega corrections from a number of sites and convey this information to the satellite.

Table C.1

Possible Differential Omega Uplink Methods

ALTERNATIVE	PROPAGATION	NO. OF STATIONS TO GIVE EQUIVALENT OMEGA COVERAGE	DATA RATE	COMMENTS
1. Satellite	Equivalent Omega Coverage	One-Two Satellite Plus Ground Stations	Fast	Increased Avionics and Satellite Cost Unless Satellite Used For Other Functions
2. UHF/VHF	Line-of-Sight	1000+	Fast	Comparable to Locating Transmitters at Existing VORs
3. DDBS	Line-of-Sight	1000+	Fast	Data link to be added to DME and TACAN stations
4. DABS	Line-of-Sight	Projected DABS Structure (Still Not Complete Ground-Up CONUS Coverage)	Fast (Must be Integrated Into DABS Format)	Would make Navigation and Surveillance Systems Interdependent
5. HF	Beyond Line-of-Sight	Not Assessed	Good	Poor Reliability Due to Signal Fading and Hoping
6. LF	Ground Wave	Six-Eight	Good	Cost of Transmitting Stations Would be Substantial
7. Existing LF/MF	Ground Wave	1200 Existing (Still Not Complete Ground-Up Coverage)	Good	Maximum Range of 75 nm
8. Dedicated VLF Station	Equivalent Omega Coverage	One	70 Baud	Must Obtain the Use of An Existing Station or a New Station
9. Omega Dead-Time	Same as Navigation Signals	Existing Omega Ground Station	70 Baud	Complete Ground-Up Navigation From the Existing Omega Station

C.3.2 VHF/UHF (Line-of-Sight Limited) Uplink

Line-of-sight (VHF/UHF) ground transmitters are usable for differential Omega. Specific possibilities are UHF data link, VHF data link on the navigation frequencies (108.0-117.95 mHz), VHF data link on the communication frequencies (118.0-135.975 mHz), Digital Data Broadcast System (DDBS--essentially a data link interleaved with TACAN and DME replies), and the Discrete Address Beacon System data link (DABS). VHF/UHF data link is an attractive option for differential Omega uplink because the technologies required are already well known and in production. Conventional telephone line data formats, using existing amplitude modulation receivers and transmitters, may prove adequate. Alternatively, multipath resistant coding could be employed to substantially reduce the transmitter siting problems often encountered with VOR siting. DDBS, as a subset of TACAN, is less attractive as a DDBS/differential Omega system implies a redundancy of navigation systems. DABS data link is another alternative, but use of DABS would compromise the traditional separation of navigation and surveillance functions.

C.3.3 HF/MF/LF/VLF (Non-Line-of-Sight) Uplink

Non-line-of-sight propagation methods are attractive because increased low altitude coverage can be provided without terrain limitations. HF uplinks may not be desirable since these ratio signals are subject to skipping and fading, and may be too unreliable for a differential Omega uplink. LF/MF stations are candidates, but the LF and MF bands are crowded with commercial AM broadcasts, aeronautical beacons, and marine beacons. As with VHF/UHF, data links on AM or FM subcarriers at voice frequencies is an attractive alternative, using existing beacon transmitters and receivers. Differential Omega using dedicated VLF transmitters is possible but the low data rates obtainable

at VLF would negate the advantages of supplying differential corrections over wide areas. Transmission of differential corrections by Omega stations during the 0.2 sec dead time between transmissions would suffer from the same limitations.

The recommended approach is to use existing aeronautical and marine beacon by adding a sidetone for the data link.

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